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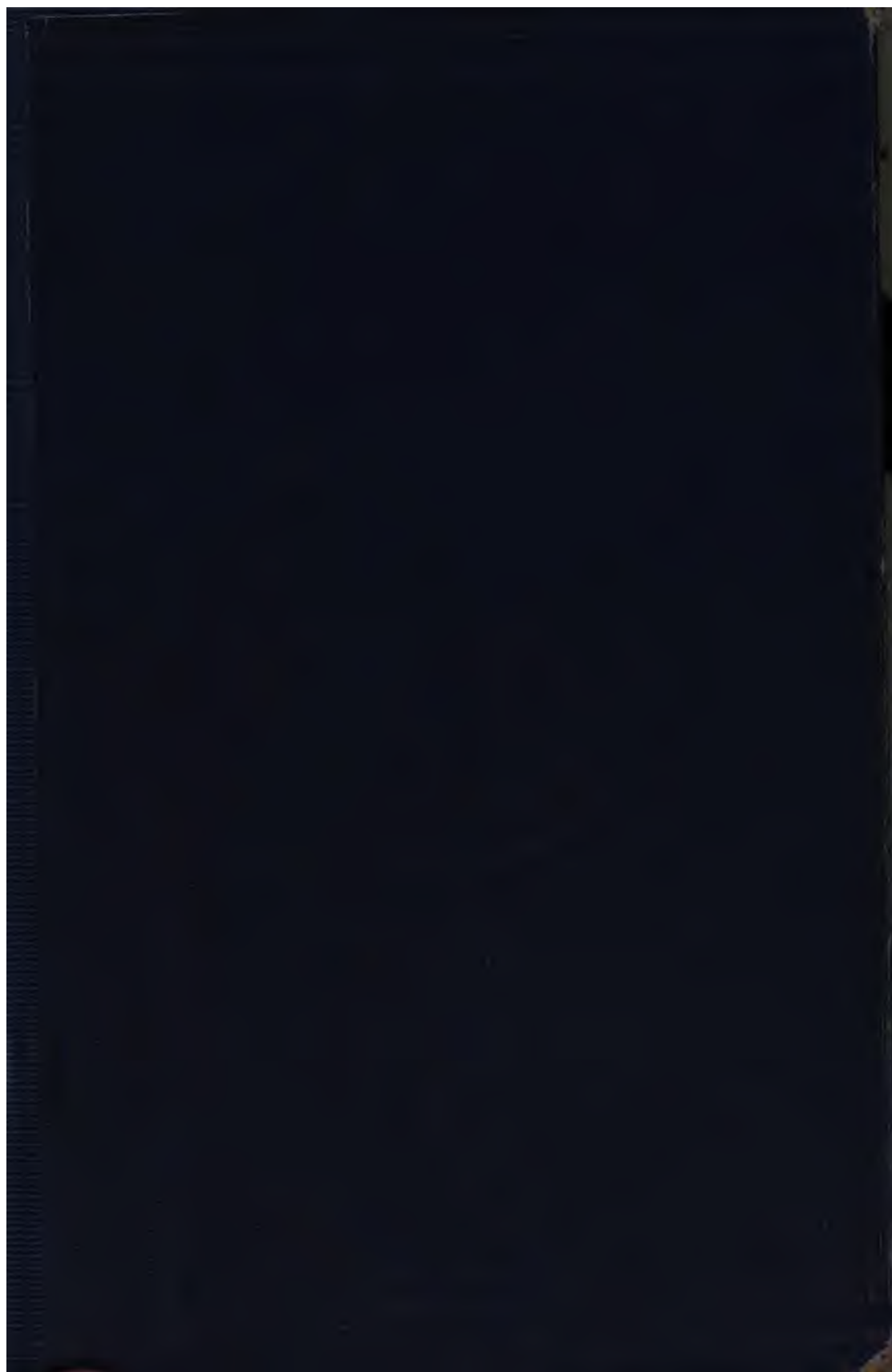
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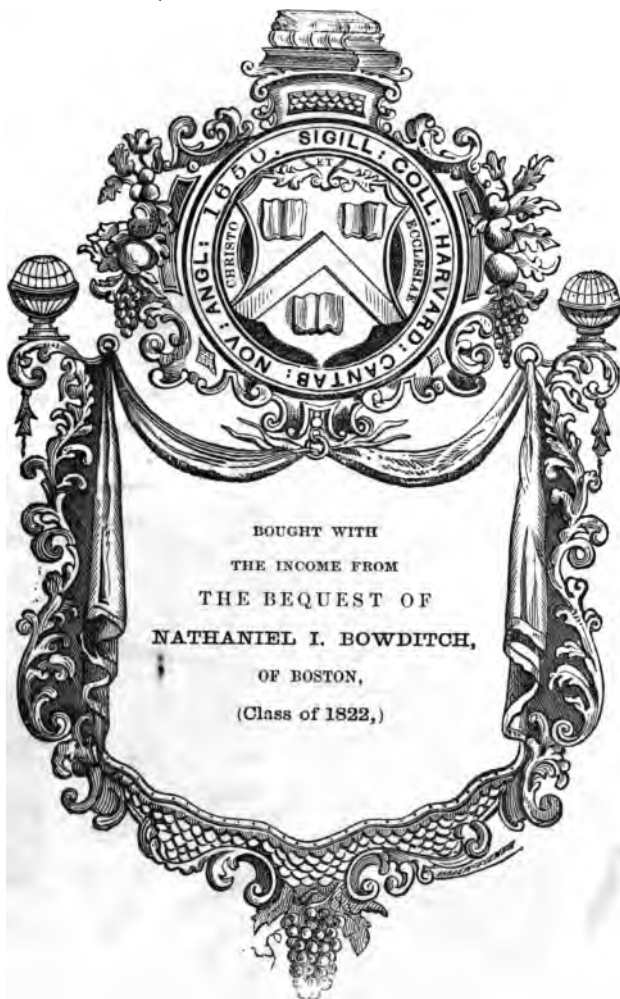
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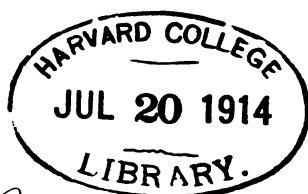
THE
REFORM
OF THE
CALENDAR

BY
ALEXANDER PHILIP
M.A., LL.B., F.R.S. EDIN.

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A PERPETUAL CALENDAR.

1910 or any subsequent year.

I. NEW YEAR'S DAY.

January.	February.	March.	April.	May.	June.
1 S.	1 Tu.	1 Th.	1 S.	1 Tu.	1 Th.
2 M.	2 W.	2 F.	2 M.	2 W.	2 F.
3 Tu.	3 Th.	3 Sat.	3 Tu.	3 Th.	3 Sat.
4 W.	4 F.	4 S.	4 W.	4 F.	4 S.
5 Th.	5 Sat.	5 M.	5 Th.	5 Sat.	5 M.
6 F.	6 S.	6 Tu.	6 F.	6 S.	6 Tu.
7 Sat.	7 M.	7 W.	7 Sat.	7 M.	7 W.
8 S.	8 Tu.	8 Th.	8 S.	8 Tu.	8 Th.
9 M.	9 W.	9 F.	9 M.	9 W.	9 F.
10 Tu.	10 Th.	10 Sat.	10 Tu.	10 Th.	10 Sat.
11 W.	11 F.	11 S.	11 W.	11 F.	11 S.
12 Th.	12 Sat.	12 M.	12 Th.	12 Sat.	12 M.
13 F.	13 S.	13 Tu.	13 F.	13 S.	13 Tu.
14 Sat.	14 M.	14 W.	14 Sat.	14 M.	14 W.
15 S.	15 Tu.	15 Th.	15 S.	15 Tu.	15 Th.
16 M.	16 W.	16 F.	16 M.	16 W.	16 F.
17 Tu.	17 Th.	17 Sat.	17 Tu.	17 Th.	17 Sat.
18 W.	18 F.	18 S.	18 W.	18 F.	18 S.
19 Th.	19 Sat.	19 M.	19 Th.	19 Sat.	19 M.
20 F.	20 S.	20 Tu.	20 F.	20 S.	20 Tu.
21 Sat.	21 M.	21 W.	21 Sat.	21 M.	21 W.
22 S.	22 Tu.	22 Th.	22 S.	22 Tu.	22 Th.
23 M.	23 W.	23 F.	23 M.	23 W.	23 F.
24 Tu.	24 Th.	24 Sat.	24 Tu.	24 Th.	24 Sat.
25 W.	25 F.	25 S.	25 W.	25 F.	25 S.
26 Th.	26 Sat.	26 M.	26 Th.	26 Sat.	26 M.
27 F.	27 S.	27 Tu.	27 F.	27 S.	27 Tu.
28 Sat.	28 M.	28 W.	28 Sat.	28 M.	28 W.
29 S.	29 Tu.	29 Th.	29 S.	29 Tu.	29 Th.
30 M.	30 W.	30 F.	30 M.	30 W.	30 F.
		31 Sat.			31 Sat.

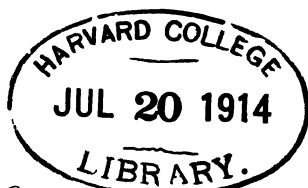
LEAP DAY (in Leap Years).

July.	August.	September.	October.	November.	December
1 S.	1 Tu.	1 Th.	1 S.	1 Tu.	1 Th.
2 M.	2 W.	2 F.	2 M.	2 W.	2 F.
3 Tu.	3 Th.	3 Sat.	3 Tu.	3 Th.	3 Sat.
4 W.	4 F.	4 S.	4 W.	4 F.	4 S.
5 Th.	5 Sat.	5 M.	5 Th.	5 Sat.	5 M.
6 F.	6 S.	6 Tu.	6 F.	6 S.	6 Tu.
7 Sat.	7 M.	7 W.	7 Sat.	7 M.	7 W.
8 S.	8 Tu.	8 Th.	8 S.	8 Tu.	8 Th.
9 M.	9 W.	9 F.	9 M.	9 W.	9 F.
10 Tu.	10 Th.	10 Sat.	10 Tu.	10 Th.	10 Sat.
11 W.	11 F.	11 S.	11 W.	11 F.	11 S.
12 Th.	12 Sat.	12 M.	12 Th.	12 Sat.	12 M.
13 F.	13 S.	13 Tu.	13 F.	13 S.	13 Tu.
14 Sat.	14 M.	14 W.	14 Sat.	14 M.	14 W.
15 S.	15 Tu.	15 Th.	15 S.	15 Tu.	15 Th.
16 M.	16 W.	16 F.	16 M.	16 W.	16 F.
17 Tu.	17 Th.	17 Sat.	17 Tu.	17 Th.	17 Sat.
18 W.	18 F.	18 S.	18 W.	18 F.	18 S.
19 Th.	19 Sat.	19 M.	19 Th.	19 Sat.	19 M.
20 F.	20 S.	20 Tu.	20 F.	20 S.	20 Tu.
21 Sat.	21 M.	21 W.	21 Sat.	21 M.	21 W.
22 S.	22 Tu.	22 Th.	22 S.	22 Tu.	22 Th.
23 M.	23 W.	23 F.	23 M.	23 W.	23 F.
24 Tu.	24 Th.	24 Sat.	24 Tu.	24 Th.	24 Sat.
25 W.	25 F.	25 S.	25 W.	25 F.	25 S.
26 Th.	26 Sat.	26 M.	26 Th.	26 Sat.	26 M.
27 F.	27 S.	27 Tu.	27 F.	27 S.	27 Tu.
28 Sat.	28 M.	28 W.	28 Sat.	28 M.	28 W.
29 S.	29 Tu.	29 Th.	29 S.	29 Tu.	29 Th.
30 M.	30 W.	30 F.	30 M.	30 W.	30 F.
		31 Sat.			31 Sat.

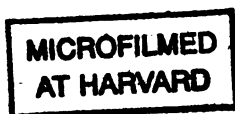
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**THE REFORM OF
THE CALENDAR**

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PREFACE

IT was reported some time ago that a sagacious student of human nature had intimated by advertisement in the newspapers that on the day following—and on that day only—he would be found on London Bridge during certain specified hours with a bag of sovereigns in his hand, which he would be prepared to distribute one by one to whomsoever might make application. He kept his word. For several hours on the day named he took his stand upon the Bridge. Many thousands of persons passed by him. When the time was up he returned home with the same number of sovereigns with which he had set out in the morning. No one had believed him. No one was willing to seem so credulous as to put his promise to the test.

Somewhat similar has been the experience of those who a few years ago began to urge the advantages of a more rational calendar. When the present writer first brought forward his

Proposal for a Simplified Calendar, in many instances it was found that politicians, economists, commercial men, lawyers, and scientists declined even to discuss it or to permit a discussion at the meetings of their societies or chambers. An astronomer with a creditable record of observatory work, in a letter to the newspapers, spoke of "Flat-earthists, Ptolemaists, Astrologers, Circle-squarers, Pyramid-worshippers, Calendar Reformers and other purveyors of useless novelties."

The dislike and suspicion which the idea at first encountered seem already ridiculous. But these things are not without their value. They are the proper prognostics of progress. They are the protest which the routine mind naturally raises against real reform. Of all things a change in the calendar seemed most obviously to threaten the ritual of routine. The resultant discussions have, however, shown that a reform beneficial to all and injurious to none can be very simply accomplished.

And so, to-day, the question is further forward. The International Congress of Chambers of Commerce has twice unanimously declared for the reform. Other public bodies have followed. The International Congress of

Scientific Academies has appointed a Committee to investigate it. The Church of Rome and the Church of England have done the same.

To summarise the work accomplished and to point out the practical conclusion is the aim of the following essay.

If the man with the sovereigns showed a shrewd understanding of human nature in venturing his visit to London Bridge, his sagacity was equally evident in his determination not to repeat the experiment. When the public realise the advantages which are so easily available by a simplification of the calendar, it is not improbable that they may seek to seize them with a rush. It is therefore desirable that the practical results of the inquiry and discussion which have taken place should be conveniently accessible to all.

The writer would like to express generally his thanks for much kind assistance received from time to time from many quarters too numerous to specify, but he cannot omit a special acknowledgment of the very kind help and far-seeing advice ever readily afforded him by Sir William Ramsay, K.C.B., F.R.S.

The cause of Calendar Reform is also largely

indebted to the able advocacy of M. Canon Legrand, Belgium; M. G. S. de Clerq, Haarlem; Dr W. Köppen, Hamburg; Sir Hugh Bell, Northallerton; Dr Büsching, Halle; M. Armand Baar, Liége; Professor Grosclaude, Geneva; M. Georg, Geneva; Lord Desborough, and many others.

XMAS 1913.

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THE REFORM OF THE CALENDAR

CHAPTER I

Of Progress Scientific and Social

EVERY intelligent person is aware of the remarkable and continuous progress which is taking place in scientific knowledge and in the application of science to the arts. The constant improvement in the conditions of civilised life in modern times bears unceasing testimony to the reality of this progress. Few of us are so young or so unobservant as not to have had ample evidence of the fact, even within the time covered by our own personal recollections. And if we extend our consideration over a longer period, we find only a stronger confirmation.

We visit an engineering museum, and we see there a model of Stephenson's first locomotive,

along with a succession of subsequent designs, down to the magnificent engines of to-day. The same thing occurs if we examine an exhibition of electrical apparatus, of ships, of motor-cars, or indeed of any sort of scientific or mechanical contrivance designed for the service of mankind.

But when we turn to the arrangements provided for the regulation of human action, a strange contrast presents itself. If we compare a statute or Act of Parliament of a hundred years ago with one passed last session, not only do we find no such improvement in its conception or draughtsmanship, but the comparison is, if anything, unfavourable to the more recent production. The organisation of labour, or of the traffic of our streets, the arrangements of business in Parliament, in the Law Courts, or in the Stock Exchange, reveal no such evident signs of steady and constant improvement. No doubt there are many changes, and more than enough of novelties and alterations, but of a general, orderly, continuous progress there is really no appearance.

Take, for example, a railway. Compare, as we have done, the locomotive of sixty years ago with the locomotive of to-day ; the evidence of

improvement is beyond question. Compare, again, the railway time-tables of that period with those of the month now current. No doubt the speed of trains is accelerated, the quantity of traffic is enormously increased, but in the smooth working and simplicity of traffic arrangements there is, we fear, very little improvement,—certainly no indication of any such steady, continuous progress as we are accustomed to expect in connection with mechanical contrivances. Or, again, consider the movements of the community during the holiday season in the month of July, and let anyone honestly say whether order, organisation, and method are more or less conspicuous as the years roll on. Take, again, the question of unemployment, about which we do not hear much at the moment, but which was very much in evidence only a few years ago. One of the loudest of the quack prescribers for the evils of unemployment stumbled upon what we believe to be an obvious truth, when he declared not long ago that the main cause of unemployment was “irregular employment.” There is indeed little doubt that the main cause of the industrial unrest, which weighs like a nightmare on modern life, is just this irregularity in

the employment and occupations of the vast majority of men. And this irregularity is becoming not less but greater as time goes on.

In Scotland, where these lines are written, the Health Insurance Act, the Shop Hours' Act, the House-letting Act are now in full operation. What has the effect been of all these various efforts at social amelioration? In no party spirit we reply that, whilst none may be without its good points, one undoubted result has been to make the confusion of our social conditions a good deal worse confounded.

It is to the advance of scientific knowledge and its applications that the remarkable amelioration of the conditions of civilised life during the last century or so is due. And the very vastness and universality of this improvement usually blinds us to the fact that it has not extended itself to the regulation and organisation of human activity. Yet the ever-growing unrest and discontentment, which are seething in all ranks of society, bear conclusive testimony to the fact that there is something sadly unsatisfying and far amiss in the present condition even of the most civilised states.

Now what is the cause of this strange

contrast? To answer this immensely important question, let us ask for a moment what are the conditions which have rendered scientific and mechanical progress possible?

We reply that such progress is possible because it is cumulative. The modern locomotive, the modern "Cunarder," the modern motor-car or telephone exchange have not leaped fully equipped from the brain of the inventor. On the contrary, their improvement has been a gradual and continuous process. In the case of the locomotive, starting with Stephenson's "Rocket," its defects were noticed, improvements one by one were tried and tested, the good were retained, the defective were discarded, and in this way the engineer has arrived at the locomotive of to-day. And only because he could proceed thus was the improvement possible.

The remark is of universal application. In short, the course of scientific progress resembles the erection of a building. Just as St Paul's Cathedral arose surely and gradually, as one row of stones was laid upon another, so has the course of mechanical improvement gone on its way.

But such gradual building is only possible

upon a fixed and steady foundation. If an earthquake were annually to shake to the ground all the work of the preceding year, obviously neither St Paul's Cathedral nor any other similar edifice could ever have been reared. And in like manner a basis of fixed data is the essential prerequisite of scientific and mechanical advancement. Suppose, for example, that by some strange convention the meaning of the figures we employ in numerical notation were to change every year; suppose the figure which this year represents 2 were next year to mean 3, next year 4, and so on; suppose, again, that our weights and measures were to fluctuate in a similar manner—that a yard which this year meant 36 inches were next year to be 35, next year 34, and so on, returning to its original signification only at distant and irregular intervals,—then we affirm, without fear of contradiction, that the whole fabric of science and the mechanical arts could never have been raised at all, and, so far as these are concerned, we should in such circumstances have been compelled to rest content to-day with the very simplest and most primitive appliances.

Yet, strange as it may sound, such are the

conditions under which, in modern society, human action is organised. For what is the framework, the basal datum by which we arrange our actions? It is no other than the scheme under which we arrange our time—in one word, our Calendar.

CHAPTER II

Of the Effects of an Unstable Calendar

WE have said that the disorganised state of all social arrangements is ascribable to the calendar. A little consideration will make this clear. The dislocation of our calendrial arrangements is due to two distinct causes. These are, first, what we may call the incongruity of the week ; secondly, the irregularity in the lengths of the months, and the position of the odd day in leap year. The disturbance caused by the former of these causes is perhaps the more obvious, and we shall therefore in the first place refer principally to it.

The week formed no part originally of the Julian Calendar. Its observance throughout the Roman Empire appears to have been enacted first in the reign of Theodosius, a most Christian emperor who endeavoured in every direction to undo the work of the Apostate. Be that as it may, the arrangement of the week

now very largely dominates all the engagements of civilised society. Unfortunately, as everyone knows, the days of the week do not stand in a constant relation with the other elements of the calendar. A period of 52 weeks completes itself in 364 days. There is thus a remainder over of one day in ordinary years and two days in leap years. The relation of week days to the monthly enumeration is thus constantly fluctuating.

If every day of the week were alike suitable for any engagement, this incongruity would be of little consequence; but we all know that this is not so. Not only in the case of Sunday, which is legally a *dies non*, is the constant change in the calendar position of the week days a cause of disturbance, but even in the case of other week days we often find that it is practically inconvenient to alter the day of the week on which recurring appointments are observed. Not infrequently when the avoidance of a Sunday is the only object in view, engagements are appointed for a definite day of the month or for the next lawful day thereafter. Where, however, it is desired to retain always the same day of the week for particular engagements, the usual expedient adopted is to fix

Table showing the seven different ways in which the days of the week and the month can correspond.

S.	M.	Tu.	W.	Th.	F.	S.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				
<hr/>						
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			
<hr/>						
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		
<hr/>						
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	
<hr/>						
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
<hr/>						
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						
<hr/>						
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

such engagements for the first, second, third, fourth, or last Monday, Tuesday, or as the case may be, of a particular month. We have become so accustomed to these expedients that we do not readily observe how they disturb and dislocate our arrangements, and render impossible any permanence or continuity in our scheme of action.

Suppose, for example, that a holiday in Glasgow is fixed for the first Tuesday of July, and one in Edinburgh for the first Wednesday of the same month. In a year in which July begins with say a Monday or a Tuesday, these two days would be in immediate juxtaposition with each other. For the service of these holidays a great variety of special arrangements require to be made, not only by railway companies but by many others as well. If the relation between the two days were a constant one, the arrangements made in one year would be a basis which could be founded on in subsequent years. Particular arrangements which proved inconvenient or ineffective would be improved or abandoned and other expedients substituted, until gradually a more and more perfect working scheme should be arrived at; or if the juxtaposition were found to be alto-

gether impracticable, one or other of the holidays would be altered to a more convenient date. But under existing conditions such improvement is impossible. If the two days in question are in juxtaposition this year, because July begins on a Tuesday, next year when July begins on a Wednesday the first Wednesday is the 1st of the month, and the first Tuesday does not occur until the 7th of the month, being the Tuesday of the week following. All the arrangements made this year are therefore of no use or avail, and an entirely new set of arrangements must be devised, only, however, to be again shaken to pieces in the succeeding year when the two holidays will again recur in juxtaposition.

This, of course, is only one example, but it is an example of what is continually happening everywhere and always. It enormously disturbs the working of our railway system, and equally so the working of all other instruments of holiday traffic.

If the variations of the yearly calendar were few in number, and always succeeded one another in a definite, rhythmic and easily intelligible order, it might be possible to adjust our time-tables and arrangements with some

sort of corresponding harmony ; but under our present calendar the irregularities are too great to admit of this being done, a fact which will be very evident from a consideration of the accompanying table, showing in successive columns the years between 1901 and 1950 which have identical calendars. The period which contains all the possible varieties in the relations between the week days and the month days involves a revolution of 28 years, which, as an element of the Julian Period, receives the name of the Solar Cycle, one of which cycles commenced in 1896.

The Years with Identical Calendars 1901-51.

CHAPTER III

Further Inconveniences caused by our Unstable Calendar

IN our last chapter we took an instance of the irregular correspondence of holidays as an evidence of the disturbances for which our present calendar is responsible. Perhaps some may say that after all it is the arrangement of our business days, not our holidays, which is entitled to our first attention. That, of course, is true, but then it cannot be overlooked that our business arrangements are affected, and constantly and very gravely affected, by our holiday arrangements. If our calendar admitted of a permanent scheme of holidays, a more permanent scheme of business engagements would follow as a matter of course. Moreover, it must be remembered that what is holiday for one man means very frequently extra work to others. It is the exceptional traffic of the holiday season which constitutes

the most perplexing problem in the arrangement of railway and other travelling time-tables.

The same difficulty complicates the arrangement of work, not only in the case of railways, tramways, and the like, but in the internal economy of every commercial and industrial establishment.

But, of course, the same constant clashing and fluctuation of dates affects not only holidays but all other fixed or special appointments. It affects the arrangements which require to be made in connection with all fairs and markets, and confuses not merely the time-tables of the railways which serve them, but the engagements of all those who require to attend them.

Take, again, the case of a business man, who is an official, a director, secretary, auditor or other servant of several public companies. These companies hold meetings on stated dates, which are fixed in the same way as the holidays above mentioned. With a perpetual calendar every such business man would have a definite and permanent programme of his year's engagements, on which he could rely, on which he could build. From the experience of one year he would know exactly what his engagements would be for the year succeeding, and could

arrange accordingly. Engagements which he found incompatible one year would be incompatible always. He would therefore require either to rearrange or abandon one or other of them. The result would be that every business man would have a definite calendar of his business engagements applicable to his business life. Under existing conditions, however, this is impossible. His programme of engagements remains fluent, uncertain, and constantly subject to fresh and unforeseen disturbance.

The irregularities of the calendar equally affect the sittings of Parliament, of County Councils, Town Councils, meetings of magistrates, sessions of Law Courts, and the terms of all schools, colleges, and universities.

To take in this connection one specific example of the contrast between the order and progress which characterise scientific work and the disorder and confusion of business arrangements, let us compare what occurs when an important surgical operation is in progress with the method in which important pleadings are conducted in the Law Courts. In the former case, every possible preparation is carefully thought out and made ready beforehand. Nurses and assistants are in attendance, and

when the hour of operation arrives the surgeon is ready with all necessary assistance about him to apply himself unreservedly and exclusively to the engrossing and vitally important task which he has in hand.

Contrast this with what daily happens in the Law Courts. The day of trial in an important case, fixed long before, arrives. The solicitors and junior counsel are in attendance, but their attendance is very probably interrupted by the calling of other cases in which they are concerned at the same hour. The heavily briefed leader, who is expected to bear the brunt of the battle, is more than likely nowhere to be seen. The hearing of another case in which he is briefed has unexpectedly clashed with the former and demands his attendance. Later on, he bustles into court, hurriedly takes up from his junior some information as to the stage at which the case has arrived and the name of the witness under examination, and very likely finds time to conduct the examination or cross. But hardly has he concluded when another summons calls him to another court, and the case is left to flounder along without him. No doubt, by the payment of specially heavy fees, exclusive attendance may generally be arranged

for, but the above is a not incorrect description of what daily happens in our Law Courts, and it is affectation to pretend that such a state of affairs is satisfactory to anyone, with the doubtful exception of the doubly briefed senior himself. We do not mean to say that a more perfect calendar would of itself necessarily and immediately obviate such a state of matters, but it would render a remedy possible, and it would also introduce into all business engagements such a new spirit of order and regularity that the existing state of affairs would quickly be recognised as intolerable and would come to an end.

CHAPTER IV

Of Perpetual Calendars in the Past

Now the state of affairs of which we have been speaking is in the main ascribable to the hopeless irregularity which characterises the relation between the day of the week and the proper elements of the calendar.

Under the ancient Jewish Calendar there appears to have been much less incongruity between the week and the month. The days of the week, other than Sabbaths, were only numerically distinguished, and as regards the Sabbaths themselves, however the result was accomplished, it is evident that there was no such fluctuation as that of which we now complain. For example, it will be found on referring to Leviticus, 23rd chapter and 39th verse, that the fifteenth day of the seventh month was always a Sabbath.¹ Indeed, it is

¹ The Jews did not limit the term Sabbath to the seventh day of the week. But this circumstance merely illustrates the ready adaptability of the Jewish Calendar.

interesting to note that in order to secure that the Feast of Trumpets, which marked the commencement of the Jewish civil year, should always be observed to some extent simultaneously, notwithstanding the confusion which might be caused by error or delay in noticing the appearance of the new moon, it was provided that the two first days of the civil year should both be observed as Sabbaths.

The Roman Calendar, prior to the Julian reform, was constantly disturbed by the capricious methods of intercalation, the abuse of which in the hands of the Pontiffs was the true *raison d'être* of the Julian reform. After the establishment of the Julian Calendar, and prior to the introduction of the week by Theodosius, the Romans enjoyed the benefit of a perpetual calendar. Those of us who, as part of our education, were instructed in the details of the Roman Calendar, may be apt to remark that we often wondered how that great nation could have tolerated a scheme so complicated. But in so doing we forget that that calendar had at least this very great merit, that it was perpetual; it formed an unvarying basis on which the business and policy of Rome could be thought out and planned. The im-

portance of this fact in those times, when communication was necessarily slow and uncertain to a degree of which we can form no conception, cannot well be overestimated. But for the fact that such a perpetual calendar existed, it would have been impossible to organise the great and far-stretching energies of the Roman Empire ; and it is a very notable fact that it was only after the introduction of the Julian Calendar that the main extension of the Roman Empire took place, and only whilst that calendar remained uninterrupted that it continued to hold together.

As compared with our time, society under the Roman Empire was furnished only with the crudest of scientific ideas and the most primitive of mechanical appliances. Yet its activities were organised with the precision of a military system. What would a Roman senator or soldier have thought to-day of the street traffic of London ? What impressions would he have gathered from a visit to the Stock Exchange, to Lloyd's, or to the lobby of the House of Commons ? It surely cannot be suggested that he would have seen any signs of progress and improvement in the orderly organisation of human action.

Again, it is not unworthy of inquiry how far the insuccess with which the Mahommedan peoples resist the aggressions of their Christian neighbours is ascribable to the injurious influence which their calendrial scheme must have upon the effective organisation of their resources.

CHAPTER V

Of the other Defects of our Calendar

IF we turn to the arrangement of the lengths of the months under our present calendar we discover a multitude of other defects and inconveniences which are consequent thereupon.

In the first place, we have the anomalous length of the month of February. The calendar month is roughly a one-twelfth fraction of the year, and as such it has been found to be a most convenient unit for the measurement of time. The fact that, notwithstanding the present irregularities in the lengths of the months, it is still extensively employed, proves very clearly that in the language of the advertisers "it supplies a felt want." But its employment is restricted far more than we are usually aware by the anomalous length of February. If the months were always of either 30 or 31 days in length, the use of the calendar month as a standard of measurement would

be considerably facilitated and increased. No doubt, as we shall see later on, it is practically impossible to secure that the months shall all be of one and the same length. But if only one inequality had to be provided for, and if, moreover, as could easily be arranged, the 30- and 31-day months succeeded one another in a rhythmical and symmetrical order, the utility of the month as the measure of a period would be greatly increased.

This is all the more important when we recollect that one-twelfth is a most convenient practical fraction, lending itself readily to a division of the year by two, three, and four, the most usual and natural divisors.

The week, on the other hand, is not an exact submultiple of the year, and without interfering with its uniformity cannot be made so. Moreover, in any case, the use of the week does not facilitate the division of the year by the convenient divisors above mentioned. All the more therefore is the irregularity of the months a constant source of inconvenience.

The irregularity with which the 31- and 30-day periods succeed one another in the case of the other eleven months is, of course, a further cause of inconvenience. It complicates

the calculation of days from any given monthly date to any other—a calculation which, as we shall see later on, could be reduced to the very greatest simplicity. In the calculation of interests, discounts, wages, rents, and all other periodical payments, an immense amount of unnecessary complication is caused by the present arrangement or want of arrangement. All this causes a great amount of additional and unnecessary labour in banks, counting-houses, and other financial and commercial establishments.

The week is originally a labour period. The month is the special instrument of calculation in commerce, business, and finance. To all classes interested in these activities, therefore, the irregularities of the months are an incessant source of trouble.

Everyone knows the advantages which, largely owing to the Americans, have recently been found to lie in standardising parts of machines. The month is the great machine of business calculation, and if its length could be standardised a corresponding advantage would immediately ensue.

One branch of calculation to which these remarks are specially applicable is the employ-

ment of statistics—now so essential not only to commerce but to politics and local government.

These considerations are enforced by the fact that the irregularities of the present months involve an inequality in the length of the four quarters of the year. Experience in all civilised countries discloses the immense and constant utility of the quarterly period of three months, known in France and other countries as a *trimestre*. The same period of three months is the most usual period of currency of commercial bills of exchange. Under our present calendar the length of the first quarter is 90 days, of the second 91, and of the third and fourth 92 days each. No doubt it may be said that these differences are not great. That is true, but the fact remains that they render the quarters unequal and irregular; the advantage of standardisation is completely lost, and the utility of the *trimestre* is very largely nullified.

If the quarters could be adjusted to a uniform length of 91 days, not only would that period correspond in each case to two months of 30 days each, and one of 31 days, but it would also exactly represent 13 complete weeks. The advantage of such uniformity in all matters

of bookkeeping, and especially in the auditing of accounts, would be very great. With whatever day of the week a quarter commenced, each quarter would always contain 13 weekly pay-days, and many books of account could in these circumstances be scheduled.

These considerations may seem to affect primarily the commercial classes, but they necessarily react upon the industrial classes. The greater the simplicity and economy in the counting-house, so much the larger is the available wages fund. Indeed, so far as they are personally concerned, the working men, who cannot command the services of a staff of trained and experienced clerks and accountants, have a far stronger interest in the simplification of all kinds of statistics than any other section of the community. Their interests will never be properly safeguarded until the accounts and statistics which they are concerned to understand can be presented in a form so simple that he who runs may read. Working men will then be able to undertake the intelligent direction of their own affairs, and the quack politician, the faddist, and the crank will find their occupation gone.

CHAPTER VI

Of the Indirect Consequences thereof

THE foregoing are some of the more direct results of the defects of our present calendar, but their indirect consequences are quite as far-reaching. They affect the orderly organisation of society in almost every direction. We can only offer a few examples.

Human activity in modern life is sustained by the organisation of innumerable institutions and societies. These include (*a*) corporate bodies charged with the administration of local government ; (*b*) schools, colleges, universities, scientific societies, and institutes ; and (*c*) innumerable charitable and benefit societies. But the beneficent energies of all these various organisations are terribly handicapped by want of co-ordination, and by what is frequently described as overlapping. The proper delimitation of their various spheres is not certainly a matter which at first sight seems

to depend upon the calendar. Nevertheless, we are satisfied that consideration will make it plain that until we have a symmetrical calendar such co-ordination will never be accomplished. After all, their interadjustment is a matter largely dependent on the place they are to take in the lives of the persons who are interested in them. And this can only be determined when a scientific and tolerably permanent calendar has been adjusted.

Another question which frequently gives rise to discussion concerns the areas which should form the units of local government or of other activities comprised within the classes mentioned above.

At one moment we find a current of opinion in favour of larger areas, but no sooner have such been established than the defects of centralisation appear, and a renewed agitation takes place for a return to the principle of decentralisation with smaller areas and greater local control. In short, a scientific frontier is a constant desideratum, not only in the delimitation of national territories but in the determination of local areas within the particular state. That, again, does not at first sight seem to be a matter which is immediately affected

by the calendar, yet once again we are well assured that on consideration it will be found that until a symmetrical and reasonably permanent calendar of engagements and arrangements is devised, we will never reach a scientific determination of this very important question.

We turn again to the question of combination or separation of offices. At one moment we find a strong movement in favour of the combination of offices. One person is appointed secretary and treasurer of some corporation or society. The combination of appointments is expected to prove beneficial. It may or it may not. Very frequently it is found that a mistake has been made, and steps require to be taken to have the appointments separated. Here, again, we have a question which at first sight does not seem to depend immediately on the state of the calendar, yet here again we are confident that reflection will show that until a definite and enduring calendar of the engagements of each public official can be drawn up, no permanent and scientific solution of the question is ever likely to be attained.

If such a symmetrical calendar as we shall describe later on were in operation, such statutes as the House-letting Act, the Half-Holiday Act,

and so forth would become practically unnecessary. The arrangements of one year being capable of repetition in the year following, custom would gradually build up and solidify into a system what experience had proved to be most suitable, and such custom would either render statutory enactment unnecessary, or if such statutory enactment were required, it would take the shape of the codification of a well-established custom in place of being the crude experiment of the busybody and the professional politician.

It is probably unnecessary to point out how enormously the working of such statutes as the Pensions Act and the Health Insurance Act would be simplified if each of the four quarters of the year were exactly equal and contained also an exact number of weeks. In many cases quarterly could be substituted for weekly payments, and the necessary bookkeeping and clerical services could be reduced to one-thirteenth of their present volume.

We might multiply such examples indefinitely, but we hope we have now said enough to show that the introduction of a simplified calendar lies at the very root and foundation of all true progress in the organisation of human

activities. The calendar being, as we have said, the scheme whereby we arrange our time, that is to say, all our actions, it naturally affects universally all the doings of mankind. Its condition is therefore of the most far-reaching importance to all. It involves us so constantly and universally that, like the air we breathe, its influence is frequently unnoticed in virtue of its very immediacy. Until recently the importance of fresh air to our animal vitality was, from its very universality and immediacy, constantly ignored. Of late years its importance has been recognised, and we may perhaps hope that in like manner society may yet come to see the immense importance which necessarily attaches to the proper arrangement of our time.

We now wish to invite the reader's attention to the reforms by which it is proposed to remove or alleviate the defects of which we have spoken. These, it will be found, are fortunately of the simplest nature. Before doing this, however, we shall say a few words as to the origin and true nature of the calendar.

CHAPTER VII

Of the Essentials of the Calendar

THE celebrated French philosopher, M. Henri Bergson, has suggested that life and time are one and the same thing. However that may be, it is certain that our knowledge of time is dependent on the operation of the great natural law of periodicity, by which also the conditions of life on our globe are very largely determined.

Every body, as Newton told us, remains in its state of rest or uniform motion in a straight line, unless so far as it is compelled by impressed forces to alter that state. In point of fact, no such condition exists in nature. The whole physical universe is in a state of tension under the constant influence of forces, and these have the result of transforming rectilinear motion into curvilinear motions which constantly repeat themselves. This great law of periodicity dominates the physical universe.

But there are two periodic motions which pre-eminently affect and dominate the life of man. These, of course, are the two principal periodic movements of the earth which he inhabits, to wit, its rotation on its axis and its annual revolution round the sun.

By these the forms of life on this earth seem to be primarily determined—animal life by the diurnal and vegetal life by the annual period. Certain it is that these two movements give us the two great natural and fundamental elements of our calendar, namely, the day and the year. The first object of every calendar is to determine correctly the relation which subsists between these two periods. Both the day and the year, however, are terms susceptible of varying interpretations, according to the point of reference by which they are estimated.

As regards the DAY, for the purposes of the calendar, the unit employed is the mean solar day. From the fact that the earth's rate of rotation upon her axis is constant, it follows that the lengths of the sidereal and of the mean solar day are both constant quantities. It is, of course, well known that the length of the day as measured by the time elapsing between the moments of the sun's successive passages

across the meridian is an irregular quantity, due principally to the varying rate of the earth's revolution at different points in her orbit. The length of the day as measured by the sundial is consequently a fluctuating quantity—exactly corresponding with the length of the mean solar day four times every year; on all other occasions being by a varying fraction either before or behind the mean solar time. The necessary corrections are indicated, under the title of Equation of Time, in every almanac, and in all civilised countries the mean solar day is now universally adopted in reckoning, although up till 1816 the actual variable solar day was employed in France and certain other countries.

The true length of the YEAR is also susceptible of varying interpretations. The sidereal year, being the period intervening between the earth's returns to a particular point in her orbit as ascertained by reference to the fixed stars, is one of the most constant quantities in nature, but differs appreciably in length from the tropical year, so called, as measured by the time elapsing between the successive returns of the sun to the equinox. It is, however, upon the latter that the seasons depend, and accord-

ingly by the universal consent of mankind the tropical year is adopted as the civil year, and is the only year employed in connection with human affairs.

The correct ascertainment of the relation between the mean solar day and the civil or tropical year is the fundamental and primary object of every calendar. It is no doubt an inconvenient, but at the same time an unavoidable fact that these two units are incommensurable; that is to say, the mean solar day is not an exact fraction of the civil year, or conversely, the civil year is not exactly a multiple of any given number of mean solar days.

At a very early period the Chaldean and Egyptian astronomers appear to have ascertained the true length of the year with surprising accuracy. But the ancient calendars were in most cases complicated by the attempt to correlate the solar year with the period of twelve lunar months.¹ This involved the employment of intercalary months. The Jews, for example, after the month Adar interpolated every second or third year an additional month known as Ve-adar.

¹ See *The Chronology of Ancient Kingdoms Amended*, by Sir Isaac Newton, p. 71 *et seqq.*

It was to obviate the inconvenience and abuse of this practice of intercalation that Julius Cæsar, in 45 B.C., undertook the reform which has since always been associated with his name. To restore the calendar to its supposed original relation with the seasons, he interpolated one year of extraordinary length (445 days), which became known as the Year of Confusion; and he so readjusted the lengths of the months as to provide a normal year of 365 days, the only intercalation then required being the one extra day in each fourth or leap year.

X

Had the length of the tropical year been exactly $365\frac{1}{4}$ days, this calendar would have perfectly accomplished its object, but the true length of the year being only 365 days 5 hours 48 minutes 46·15 seconds, it is obvious that the Julian Calendar had the effect of making the year too long by rather more than 11 minutes. This error annually accumulating amounts to a day in 131 years, and by the fifteenth century began to attract considerable attention, mainly in connection with the determination of Easter. The defect of the Julian Calendar was made good in 1582 by the proposal of Pope Gregory XIII. to omit the leap year out of three of every four century years. The error which had

accumulated on the Julian Calendar since the date of the Council of Nice, A.D. 325, was at the same time corrected. When the Gregorian Calendar was introduced into England in 1752, the error of the Julian Calendar amounted to 11 days, to correct which, the days intervening from the 3rd to 14th September 1752 were omitted, and at the same time the commencement of the year in England was changed from 25th March to 1st January, the date which had been selected by Julius Cæsar as being that of the first new moon after the winter solstice. This latter change necessitates still certain complications in referring to the dates of events prior to the change, occurring in the part of the year between 1st January and 25th March, it being customary to refer to them both by the year in which they were actually dated at the time, and also by the year following, to which, on the principle of the calendar as now adopted, they properly belonged. We mention this circumstance in order to draw attention to the magnitude of the changes then effected, and to the comparatively small amount of inconvenience which changes so extensive occasioned.

A minute residual error of a few seconds

annually still exists under the Gregorian Calendar. This error would only amount to a day in the course of between three and four thousand years, and can then easily be corrected by the omission of an extra leap day when the occasion requires. For all practical purposes, however, it may be stated that the calendar as now determined has finally established a correct method for ascertaining the ratio between the lengths of the day and the year.

Recent proposals for the reform of the calendar do not, as a rule, in any way trench upon the astronomical basis of the Gregorian Calendar as now established.

Period of the Earth's revolution	}	365 ^d 5 ^h 48 ^m 49 ^s
Length of the tropical year		
Period of the Moon's synodic	}	29 ^d 12 ^h 44 ^m 2 ^s 53 ^s
revolution		

Metonic cycle of 19 years:—

$$\begin{aligned} \text{A period of 19 tropical years} &= 6939^d 18^h \\ 235 \text{ lunations} &= 6939^d 16^h 32^m 28^s \end{aligned}$$

The Calippic period of 76 years is more constant, because it always contains the same number (19) of leap years.

CHAPTER VIII

Of the Conventional Divisions of Time

THE day and year are, as we have seen, the fundamental elements of the calendar. But 365 is too large a multiple for ordinary use, and consequently from the earliest times an intermediate division has been found necessary.

All the nations from whom our European civilisation is derived seem to have agreed in making use of the moon as the intermediate measure. The movements of the moon do not affect our life as do those of the earth itself which we inhabit, and in which movements we cannot help but participate. There is therefore no natural necessity that we should conform to the movements of the moon. But the phases of the moon constitute a most convenient natural clock, readily legible by the most uninstructed, and to this circumstance we doubtless owe the use made of the moon, and the adoption of the month as a time unit.

In the comparatively genial climates of the countries bordering on the eastern Mediterranean, the conditions are specially favourable for the observation of the lunar phases, whilst in some at least of these countries the alternation of the seasons is much less marked than in more northern latitudes. And there is some reason to believe that in those regions the month was employed as a unit of time even before the solar year was very distinctly recognised. When, however, exact measurements are taken, the length of the lunation is found not to be an exact multiple of days. The moon's synodical period is 29 days 12 hours 44 minutes. The earliest civilisation to which anthropologists take us back appears to have been that of the Assyrians and the Egyptians, which is now sometimes called the River civilisation, as it developed on the banks of the great rivers. These peoples appear from the earliest times to have reckoned all their months as of 30 days each, thereby departing at once from any attempt to coincide with the actual length of the lunation, and treating the month as an arbitrary multiple of days. No doubt the period was fixed in recognition of the fact that the lunation completes itself

on the thirtieth day, but no attempt was made to follow the exact length of the moon's period. It may be remarked, in passing, that this appears to have been not only the earliest, but the most perfect calendar which could be devised, the year being completed by the addition of five intercalary days at the end of the twelve equal months.

This civilisation was succeeded by what is frequently called the Mediterranean civilisation, which exhibits features common to all the races affected by it, although these were ethnologically very widely distinguished. It includes the Jews, the Greeks, and the Romans, all of whom apparently adhered more closely to the actual lunar movement by adopting months of 29 and 30 days alternately. The result of this arrangement was to give a lunar year of 354 days. To complete the solar year and correct other inequalities, the expedient was adopted of introducing an intercalary month of varying length every two or three years. These are the principles upon which the Jewish Calendar was based.

In the Greek Calendar also the lunar month was prominent, and many efforts were made to accomplish the well-nigh impossible task of

producing a combined luni-solar calendar. Great importance was attached by the Greeks to the discovery by Meton of the fact that, in a cycle of 19 years, a very close approximation is got to an exact number of lunations. This approximation was even closer in the Calippic cycle of 76 years. But the genius of the Greek mind did not lie in the direction of organisation, and the Greeks' efforts in calendar construction have not had any permanent influence, and need not therefore be further described.

X The length of the Roman months was also originally derived from the moon's synodical period; but a dislike to even numbers, which was deeply seated in the Latin mind, had apparently led to the observance of months of 31 and 29 days, four being of 31 days and the remainder of 29. An intercalary month was thus rendered necessary about every third year. In Rome the Pontiffs, to whose hands the adjustment of the calendar was entrusted, abused the power of intercalation for political ends. A consul whom they favoured found his year of office extended by the premature intercalation of an extra month; whilst one whom they disliked had his reign cut short by the postponing of an intercalation perhaps already

overdue. The result was that in troubled times the Roman Calendar gradually got out of hand, and by the time of Julius Cæsar the confusion which prevailed was creating universal disturbance.

It was these abuses which really led Julius Cæsar to establish the calendar which has ever since borne his name. His idea was to reduce the intercalations to a minimum, and to take care that that minimum should be operated automatically and with unvarying regularity. He therefore allowed no intercalcation except the 366th day every fourth year, to complete the fraction of a day over 365 days which makes up the solar year. To obviate all other intercalations, either one or two days were added to the length of the shorter months. The months thus came to be of 31 and 30 days alternately, and ceased to have any astronomical relation to the moon's period. They became simply arbitrary fractions of the year. The attempt to constitute a combined luni-solar calendar was thus abandoned. Julius Cæsar still, however, unfortunately retained the idea of arranging the months in pairs, a plan which owed its origin, as we have seen, to the attempt to make the month conform to the lunation. This plan,

however, resulted in an ordinary year of 366 days, being the amount of twelve months of 31 and 30 days alternate length. It became necessary to deduct one day from one month, and as the intercalations had previously been made at the end of February, which until then had been the last month of the Roman year, that month was selected for the purpose, and was reduced in length to 29 days in ordinary years. Naturally, therefore, the 366th day in leap years was introduced here, and February was restored in these years to the length of 30 days. No doubt any intercalation ought to be made either at the beginning, middle, or end of the year. February, therefore, was a proper place for such under the pre-Julian Calendar, but was no longer suitable after Cæsar had fixed the commencement of the year at the 1st of January. Unfortunately, however, the intercalation had become associated with certain religious observances, known as the Feasts of the Terminalia, which were celebrated in February, and for this reason Cæsar, although he had changed the commencement of the year to the 1st of January, did not feel himself strong enough to enforce any change in the date at which intercalations

were made. He was therefore obliged to introduce his leap year intercalary day in the month of February, which his own action had now rendered quite unsuitable for that purpose.

In 44 B.C., soon after the Dictator's death, the month Quintilis was renamed after him July. When, for political reasons, his nephew Augustus subsequently resolved by legal enactment to declare the divinity of himself and his uncle, it was decided as an auxiliary measure that the month Sextilis should be named after him. July and August thus received the names which they have ever since borne. But, at the same time, in order that the month called after himself should be as long as that called after his uncle, or perhaps because of the belief that even numbers were unlucky, Augustus raised August to a month of 31 days, and reversed the alternate lengths of all the subsequent months.¹ This gave seven months of 31 days in the year instead of six, and involved the docking of another day off February. Notwithstanding these alterations, which completely destroyed the symmetry of the Julian Calendar, the Romans, as we have already

¹ See *La Chiave del Calendario Gregoriano*, published (con licentia degli superiori) at Lyons, 1583, p. 148.

mentioned, continued to enjoy the advantages of a perpetual calendar until the week was legalised some centuries later.

The 7-day week formed no part of the Greek or Roman Calendar, and as it is not an aliquot part either of the month or of the year, it has never been regarded as technically an element of the Julian or Gregorian Calendar; and when the Gregorian reform was introduced no interruption in the succession of week days was made.

Various suggestions have been put forward as to the origin of the week. It is not infrequently said that it was originally a fourth part of the lunation, and that each week was intended to mark a successive lunar phase. But the disparity of length appears too great to justify this suggestion, and we have been unable, after careful consideration, to find any origin of the week so historically probable as that which maintains that it was from the first a religious institution.

CHAPTER IX

The Reform of the Calendar

WE have now seen something of what a calendar essentially is, and also of the very grave and serious inconveniences which constantly follow from the existing calendrial arrangements.

(a) As we have more than once observed, the introduction of the week side by side with the Julian Calendar entirely destroyed its *perpetuity*. All civil as well as religious observances being regulated by the days of the week,—these could no longer occur in successive years upon days occupying the same numerical position in the year. All arrangements depending upon the calendar were necessarily disturbed and required readjustment annually. To revert to an illustration already offered. What, we might ask, would be thought if we arbitrarily altered the amount of our weights and measures by one-seventh of their value once every year? or what would be thought if the letters of the alphabet

were obliged to move one step up every year on the 1st of January? Yet these alterations, absurd as they may seem, would not occasion a disturbance more universal than that which we voluntarily impose upon ourselves by the annual dislocation of the calendar.

To bring the weekly succession into harmony with the days of the year, there are two possible expedients available.

First, the result can be accomplished if one day in each year and the odd day in leap year are excluded from the weekly succession. The present writer, in formulating this proposal, made use of a well-known legal term, and proposed that these days should be treated as *dies non*. This has led to a good deal of misunderstanding, it being thought that the intention was that by some fiction it should be pretended that these days did not exist. That, of course, is not the correct meaning of the expression. In the civil law the term *dies non* simply meant a day on which public business could not be transacted, in fact, a civil Sunday,—and nothing more has been intended now,—although for many centuries after the institution of the bissextile day in leap year it was treated as legally part of the day preceding, and an Act

of Parliament making provision to that effect was actually passed in England in 21 Henry III. A.D. 1236, bearing the rubric, *De anno bissextili*.¹

Second, the same result could also be reached by making the ordinary length of the civil year 364 days, and maintaining its correspondence with the solar year by a more extended use of the principle of intercalation,—the intercalary periods being a week and a fortnight, which would be required, approximately, at intervals of 7 and 28 years respectively.

(b) It is very remarkable that either of these expedients would assist *uniformity* to be attained also in the arrangement of the months and quarters. We have noted that at present the lengths of the quarters are irregular, the first consisting of 90, the second of 91, and the third and fourth of 92 days each. If the 365th and 366th days were enumerated merely as days of the year, the remaining 364 days would permit of a division into four quarters

¹ The 366th day under the original Julian Calendar was intercalated at the sixth day before the Kalends of March, namely, the day after 23rd February, which day was held to be duplicated, the additional day being regarded legally as a mere *punctum temporis*, hence the name bissextile.

of 91 days each, which might be divided into two months of 30 and one of 31 days, thus ensuring symmetry in the four quarters of the year, and a great consequent saving in the calculation of all apportionable payments. Each of these quarters, moreover, would necessarily comprise 13 exact weeks. The original grouping of the months into pairs of 29 and 30 days was due, as we have seen, to an endeavour to follow the length of the lunation, which so nearly amounts to $29\frac{1}{2}$ days. At the best, that arrangement was nearly three-quarters of an hour wrong every month, but when one day was added to each month, so that the pairs consisted of months of 31 and 30 days each, this grouping had no longer any connection either with the moon or any other natural phenomenon ; and no conceivable reason can be urged why we should not prefer the arrangement of the months in four groups of three, which would correspond to the four seasons of the year, and to the universal practice of the community in all civilised countries.

The advantages to be derived from the establishment of four such equal quarters are, as we have already indicated, very numerous. The period elapsing from *any day* in *any* month

to the corresponding day three months forward would always be the same, namely, 91 days. *Any* period of *three months* would always consist of 91 days. Each quarter would always contain 13 weekly pay-days, and would therefore include 13 weekly payments. Harmony and simplicity would be introduced into the financial business of the year. The keeping of accounts would be simplified, and accounts themselves more easily understood. The 365th and 366th days could be observed as general holidays. If found suitable, they need not be computed in the ordinary calculation of rents, interests, and discounts. Work done on either of them would not be included in the ordinary weekly wage, but might be separately and specially remunerated, and payments for the ordinary work of the remainder of the year could then be clearly and simply stated either by week, month, or quarter.

CHAPTER X

Proposals for Reform

A LARGE number of proposals have from time to time been formulated for the improvement of our calendar on the lines already indicated.

A proposal of this sort formed part of the theory of social amelioration associated with what is called the Positive philosophy inaugurated by Auguste Comte.

A proposal on somewhat similar lines was advocated in England some years ago by Mr Moses B. Cotsworth, formerly of York. But these proposals seem both to have involved the establishment of a year containing 13 equal months of 28 days each. They involved, therefore, not only the alteration of the length of every one of the twelve months of the year, but an alteration also in the total number of months from 12 to the extremely inconvenient number of 13, with the consequent introduction of an altogether new month. The disturbance

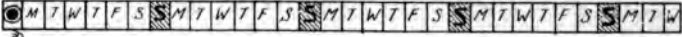
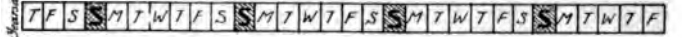

which changes so extensive would necessarily have caused would have very largely detracted from the advantages which were intended to be secured. It is not therefore surprising that neither of these proposals impressed the business community either in Great Britain or on the Continent.

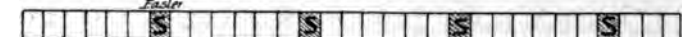


Some years ago the present writer turned his attention to the subject, and in December 1907, being then unacquainted with the suggestions previously formulated, he published his *Proposal for a Simplified Calendar*, the scheme of which is represented on one of the accompanying diagrams. This proposal, having been read before the Royal Society of Edinburgh, and submitted to the British Science Guild, and to a number of public men, attracted considerable attention in the Press. In March 1908, Mr Robert Pearce, M.P., to whom the author had submitted it, proposed to introduce a Bill into the House of Commons with the object of legalising the reform, and the Calendar Reform Bill of 1908 was the result. Mr Pearce, however, insisted on including in his Bill an enactment fixing the date of the ecclesiastical festival of Easter, an object which, however desirable, appeared to the present writer to be




CLASS B.

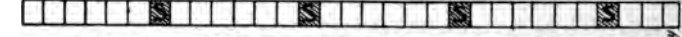
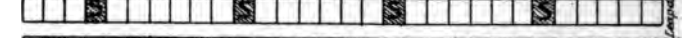

Nº1 Proposal of Mons G Armelin - Paris.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

1st Trimestre { Jan.  Feb.  Mar. 

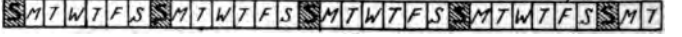
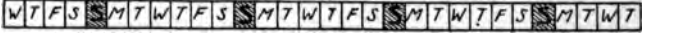

2^d Trim. { Apr.  May  June 

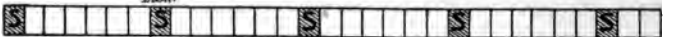
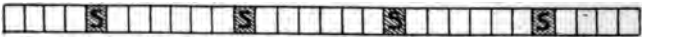

3^d Trim. { July  Aug.  Sept. 

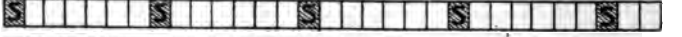
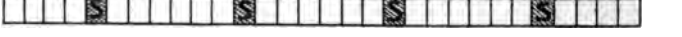

4th Trim. { Oct.  Nov.  Dec. 

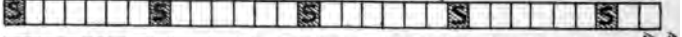
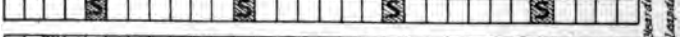

Nº2 Proposal of Mons E Hanin. - Paris

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

1st Trimestre { Jan.  Feb.  Mar. 

2^d Trim. { Apr.  May  June 

3^d Trim. { July  Aug.  Sept. 

4th Trim. { Oct.  Nov.  Dec. 

CLASS A.

N^o 3 *Proposal of M. L.A. Grasclaude - Geneva.*
 day 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
 1st Trimestre. Jan M T W T F S M T W T F S M T W T F S M T
 Feb. W T F S M T W T F S M T W T F S M T W T F S
 Mar. F S M T W T F S M T W T F S M T W T F S M T W T F S
 2^d Trin. Apr. *Easter*
 May
 June
 3^d Trin. July
 Aug.
 Sept.
 4th Trin. Octo
 Nov.
 Dec.
 N^o 4 *Proposal of Mr. Alexander Philip - Brechin.*
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
 1st Trimestre. Jan M T W T F S M T W T F S M T W T F S M
 Feb. T W T F S M T W T F S M T W T F S M T W T F S
 Mar. T F S M T W T F S M T W T F S M T W T F S M T W T F S
 2^d Trin. Apr.
 May
 June
 3^d Trin. July
 Aug.
 Sept.
 4th Trin. Octo
 Nov.
 Dec.

a matter in the first instance for the ecclesiastical authorities to determine. Another Bill, introduced into the House of Commons in 1911 by Sir Henry Dalziel, embodied a modification of the writer's proposal suggested by Mr J. C. Robertson, and which was almost identical with plans already suggested by Herr Arnold Kampe of Hamburg, and by Mr Immo S. Allen of London. The proposals of this Bill will be subsequently referred to. As the discussion which had taken place had made it evident to the writer that interference with the week-day succession was distasteful to the ecclesiastical authorities, he, in conjunction with Mr Robert Harcourt, M.P., drafted the Calendar Amendment Bill, which was introduced into the House of Commons in 1912, and under which it was proposed to limit the reform to the months.

Altogether independently of the movement in Great Britain, proposals of a somewhat similar nature had been formulated on the Continent at an even earlier date.

In 1884 an anonymous donor in Paris offered a prize of 5000 francs for the best plan of calendar reform, the competition being under the supervision of the well-known French astronomer, M. Camille Flammarion, represent-

ing the *Société Astronomique de France*. A large number of proposals were submitted, the first prize in the competition being ultimately awarded to M. Gaston Armelin for the plan figured No. 1 on the preceding illustration, and the second prize to M. Emil Hanin for the plan figured No. 2.

Subsequent discussion and criticism have disclosed a growing belief that the first prize ought to have been awarded to M. Hanin, and the present writer takes this opportunity of remarking that, before publishing his proposal, he hesitated long between the plan which in the end he published, and a scheme which commenced the quarters with a 31-day month, as is done in the plans suggested by MM. Armelin and Hanin.

No very practical result seems to have followed from this competition, but some years later the matter was reopened on the Continent by the publication in the *Journal of Horology of Geneva* of a proposal by Professor Grosclaude, whose calendar is figured on the illustration No. 3. It will be observed that this proposal is nearly identical with that published by the present writer (which is figured in the illustration No. 4), the only difference being that under

Professor Grosclaude's calendar the quarters commence with a Monday instead of on a Sunday, the object being to place the five Sundays within the 31-day month.

A number of other proposals have appeared on the Continent within recent years, which it seems unnecessary to describe in any detail, as they are merely modifications, most of which have from the first been recognised as open to objections which make it unnecessary to detain the reader with their description.

A great step in advance took place, however, when the matter was brought under the notice of the International Congress of Chambers of Commerce, which meets now every second year, and whose affairs are under the direction of a very influential and capable *Comité Permanent* sitting in Brussels. The subject was first discussed at the 1908 meeting held in Prague. At the Congress held in London in 1910 calendar reform was the first item on the programme, and after a full discussion the Congress, under the presidency of M. Canon Legrand, and without committing itself to any particular plan, unanimously adopted the following resolutions, which were reaffirmed at the Boston Congress of 1912 :—

1. *Il est désirable d'arriver à l'établissement d'un calendrier fixe international.*

2. *Il est désirable de réaliser par accord international la fixité de la date de Pâques.*

3. *Le Congrès charge le Comité permanent de provoquer l'initiative d'un gouvernement qui convoquerait une conférence diplomatique officielle aux fins de réaliser la fixité de la date de Pâques et l'établissement du calendrier fixe international.*

In accordance with the above-quoted resolution, the Government of the Swiss Republic was approached, and issued tentative invitations to the other European States, inviting them to say whether they would attend a diplomatic conference for the discussion of the question. Further proceedings have, however, been delayed, largely, it is believed, because of the fear entertained by the authorities of several states that the religious susceptibilities of their subjects might be excited.

At the Fifth International Congress of Chambers of Commerce, held at Boston in September 1912, the President, M. Canon Legrand, spoke as follows :—

“Now, as regards the religious question, I have a few words to say. It is

obvious that what we are doing does not go against any religious conviction ; we respect all convictions ; but we hold that all religions are interested to have a uniform calendar, and can so arrange it. This is what we think, we merchants and business men, while respecting at the same time all religions.

“ Furthermore, I have just received from one of my German colleagues a notice which is supposed to have come from the German Embassy at Rome to the Chancellery at Berlin, saying that it would appear that the Roman Curia, as well as the Greek Orthodox Church, would not be disposed to consider the question.

“ It would seem, then—we simply have a notification coming from Germany,—that at Rome, as in Greece, there is not a present disposition to consider the matter. That does not prevent us, however, from confirming it with our vote. We do not wish to be disagreeable to anyone ; we respect all convictions ; but we insist on saying, between business men and merchants, that it is desirable to have a fixed Easter and a uniform calendar.”

The resolutions of the London Congress were then *unanimously* reaffirmed by the Congress.

So soon as the advocates of reform can generally agree upon one simple plan, which will avoid all risk of wounding religious susceptibilities, definite progress may be looked for, and the discussion which has already taken place has been so full and extensive, that there is now reason to hope that a general agreement may be attained. If discussion be limited to the reform of the civil or monthly calendar, a diplomatic conference may be held without the slightest danger of offending any scientific or religious principle or sentiment. We therefore venture to advocate the general acceptance of a declaration in favour of one such simple proposal, particulars of which will be given in a subsequent chapter.

In the next place, however, we propose to notice one or two objections which have been directed to the entire project, and which we shall endeavour to show very briefly to be without foundation.

CHAPTER XI

General Objections to the Simplification of the Calendar answered

To begin with, we may remark that at any rate to the majority of the projects which have been brought forward no *scientific* objection is capable of being stated. This is not remarkable when we consider that the proposals now under discussion do not concern the astronomical principles on which the Gregorian Calendar is based. They do not contemplate any alteration in the relations of the day and the year, but are concerned merely with the rearrangement of the conventional subdivisions of the latter period, and the equally conventional groupings of the days.

Second, we sometimes hear the suggestion of a so-called *historical* objection. Mindful of the disorder which the introduction of the Gregorian Calendar undoubtedly caused in the reference to dates anterior to the reform, some

have feared that a similar confusion might result from the changes now proposed. A little reflection should make it clear that such fears are unfounded. The confusion in question only resulted from the introduction of the Gregorian Calendar because Pope Gregory the XIIIth made the reform retrospective in order to correct the error which, under the Julian Calendar, had continued to accumulate since the date of the Council of Nice. It was this retrospective action, involving as it did the omission of ten or eleven days in the monthly enumeration, which gave rise to the confusion between the old and the new style. The proposals now under discussion involve no retrospective change, and we may therefore set this objection aside as altogether imaginary.

Some, however, are heard to complain that the reform will introduce a hard and inflexible uniformity, and will destroy the variety of social life. Such persons do not seem to have grasped the difference which exists between variety and confusion. The increasing complexity of modern life necessitates the prudent simplification of the conditions of thought and action. The necessity of this is felt in the case of our weights and measures, as also of

the different prime-meridians, of the different monetary standards, and, indeed, in regard to all the arbitrary machinery which constitutes the necessary instrument of civilised life. The advantages of simplification in such cases are too clear to admit of dispute, but the difficulties of introducing the simplification are often very serious. The reform of the calendar now proposed has this special feature in its favour, that its introduction would not involve any derangement of established conditions.

Such a simplification is not hostile, but, on the contrary, is essential to a variety truly interesting. Thus, for example, harmony in music is not only essential to beauty, but at the same time renders possible a variety infinitely greater — whilst at the same time rational and intelligible—than that which could be produced by the most untrammelled babel of discordant noises. In like manner, the reform of the calendar, by introducing harmony and stability into the relations subsisting between its various elements, will not only involve an immense simplification and abbreviation of all purely mechanical calculations, but will at the same time give a quite new meaning and interest to all our measures of time.

CHAPTER XII

Objections to the Interference with the Succession of Week Days

As far as regards the proposals to re-establish a perpetual calendar by excluding the 365th and 366th days from the weekly enumeration, a number of objections have been stated on behalf of very influential representatives of ecclesiastical authority and opinion.

Certain of these objections are probably based on misapprehension. For example, an impression appears to have existed in certain quarters that the proposal would infringe a supposed divine command to commemorate on every seventh day the resurrection of our Lord. It seems curious that those who most strongly object to interference with the regular order of the weekly commemoration should be the strongest advocates of the maintenance of a constant fluctuation in the more important annual commemoration of the same event,

which is observed in the celebration of Easter. The fact is, that all anniversary commemorations are much more arbitrary than most people are aware of. This was well illustrated by Dr Cecil Reddie in a paper recently published on the educational advantages of Calendar Reform.

"Few people," he says, "realise the fact that there is no such thing as a real anniversary corresponding exactly to any day in any previous year. This is due to the simple truth that the rotation of the earth on its axis, which produces the period called 'a day,' is not a submultiple of the period occupied by the earth in its revolution round the sun, which we call a 'year.' Consequently, suppose a king born exactly at noon on 31st December 1908, what will be the anniversary of that auspicious moment?"

"In 1909 at 5 hours 48 minutes 46.15 seconds a.m. on 31st December; in 1910 at 11 hours 37 minutes 32.3 seconds p.m. on 31st December; in 1911 no anniversary at all; but in 1912 two anniversaries, namely, first, at 5 hours 26 minutes 18.45 seconds a.m. on 1st January, and again at 11 hours 15 minutes 4.6 seconds a.m. on 31st December, *i.e.* nearly three-quarters of an hour before noon."

But notwithstanding the criticism to which these objections may be fairly submitted, it is impossible not to recognise that a very large portion of the religious world would regard such a change as involving a departure from the spirit of the injunction which the fourth commandment contains. It is true that the establishment of a perpetual calendar on such a basis would tend not to undermine but to ensure the stability of the 7-day week. The 52 weeks of the year would then each have its appointed place in the calendar. Each would become, in fact, like a miniature month, would probably receive a name, and would be particularly associated with particular festivals, commemorations, and observances. Indeed, under such a system, the Christian year, with all its significant symbolism, might in time become a real and vital constituent of social life. But even the prospect of such marked advantages has not moved the ecclesiastical authorities. The uninterrupted observance of every seventh day appears to them to be the essential requisite of the fourth commandment, departure from which cannot be sanctioned by the Christian Church.

In the Lower House of Convocation of the

Church of England a Committee was appointed on 5th May 1911 to investigate the question, with the learned convener of which—the Arch-deacon of Bath—the writer had the honour to be in frequent communication. This Committee, in April 1912, submitted to Convocation a Report¹ in which, whilst pointing out that the Bills promoted by Mr R. Pearce and Sir Henry Dalziel were ecclesiastically objectionable, they go on to say of Mr Harcourt's Bill that "it is much less drastic, takes the line of least resistance, avoids the *dies non*, and leaves the seasons and days of the Church untouched." The findings of the Committee, which were adopted by Convocation at a subsequent discussion which took place on 2nd May 1912, are annexed to the Report. They are as follows:—

That in view of the movement for Calendar Reform by international agreement, the House deems it important to insist on the following points:—

1. *That the week of seven days should not be altered, and that Sunday should continue to be its first day.*

¹ Sold at the National Society's Depository, Westminster.
Price 2d.

2. *That no alteration should be made in the date of Christmas Day.*

From these it will be seen that the Church of England has officially refused to assent to the application of the *dies non* to the week-day succession.

At Rome the Holy See have been approached more than once, and indications have been given that the subject is under consideration by the Congregation of Rites. The Holy See will naturally be slow to give a final pronouncement on the subject, but from the expressions of opinion which have appeared in various Catholic journals, it seems unlikely that their decision will be in principle different from that reached by the Anglican authorities. Reference may be specially made to articles which appeared in the *Ecclesiastical Review*, the leading Catholic magazine published in the United States of America, in its numbers for May, August, and December 1912.

At a recent meeting of the *Comité Permanent* of the International Congress of Chambers of Commerce, the President reported that the Director of the Belgian Observatory had discussed the subject at Rome both with Mgr. Lepidi, the President of the Congregation of

Rites, and with Cardinal Merry del Val. The latter had then expressed the opinion that the arrangement of the calendar was not a question of dogma but of an Act of Government. But—referring to the application of the *dies non* to the week—his Eminence added that the question “est plus grave, parce qu’elle touche à la liturgie. Il y a, parait il, un certain espacement des jours à garder et la curie romaine admettrait difficilement une semaine dans laquelle il y aurait un jour intercalaire.”

Such objections have not been confined, however, to the Churches. The following passage from the leading English scientific journal, *Nature* (27th April 1911), shows that they find an echo in the highest scientific circles :—

“It is an unfortunate fact that a calendar of ideal simplicity is precluded by the nature of things. Much difficulty would have been avoided had the tropical year, the synodic month, and the mean solar day been commensurate periods of time, and if, moreover, the number of days in a year had contained certain simple factors. With the Julian calendar, it is true, the lunar month has been placed out of consideration. But the week remains as a

fundamental unit of time in human affairs. If only the year had contained 336 days, absolute simplicity would then have been attainable, for we should have had four equal quarters of three months each, each month containing exactly four weeks. As things are, we must be content with something less simple, and even so, commensurability between the year and the week can only be obtained by placing one day (or two days in the case of leap year) outside the ordinary run of the calendar. This is the suggestion of Mr Philip of Brechin, who has proposed that the first day of the year should be thus set aside under the name of New Year's Day, while in leap years a second day of the same kind should be intercalated between the months of June and July. The idea, of course, is not original in principle, for it was used by Auguste Comte in a slightly different way, and has been attributed to Littré. It offers the only means of avoiding a change in the calendar from year to year, and is to this extent attractive. But it has the great disadvantage of introducing discontinuity at the very point where con-

tinuity has been preserved in the face of many other changes. The week can boast a most ancient lineage, uninterrupted by the slightest break.¹ Prejudice in its favour must be anticipated, and weighty reasons must be adduced if this feeling is to be overcome."

Now the success of a calendar reform depends upon its being accepted with practical unanimity. Those who object to the interruption by one day annually of the weekly succession have frequently invited advocates of the reform to confine their attention to the months.

¹ This is not certainly beyond question. An eighteenth-century astronomer, James Ferguson, F.R.S., long ago remarked: "I find by calculation the only Passover full moon that fell on a Friday for several years before or after the disputed year of the Crucifixion was on the 3rd day of April in the 4746th year of the Julian period, which was the 490th year after Ezra received the above-mentioned commission from Artaxerxes Longimanus, according to Ptolemy's canon, and the year in which the Messiah was to be cut off according to the prophecy, reckoning from the going forth of that commission or commandment; and this 490th year was the 33rd year of our Saviour's age reckoning from the vulgar era of his birth, but the 37th reckoning from the true era thereof." (Ferguson's *Astronomy*, p. 397.) Of course, the 37th year of our Saviour's age is now acknowledged to be a quite inadmissible date for the Crucifixion.

The opinions we have quoted clearly show that this advice should be accepted. The adjustment of the monthly calendar does not of itself provide us immediately and directly with a perpetual calendar, but it does immediately provide many other advantages, and it will familiarise us with the conception of rhythm and order in our calendar arrangements, and thus at least enable the question of a perpetual calendar to be more clearly understood.

Although these two portions of the complete scheme of calendar reform can be most perfectly adjusted to each other, they are at the same time absolutely distinct and separate. There is no reason why they should be combined. Ardent advocates of reform sometimes ask why should we make "two bites of a cherry"; but although to those who have studied the subject the whole matter appears extremely simple, there is little doubt that for the general community one of these reforms is quite enough to be put forward at one time. The reform of the monthly calendar which we are to advocate now is one which would harmonise completely with the subsequent adoption of a perpetual calendar. The step would never therefore require to be retraced. At the same time, it

would leave the question of a further change—either by interfering with the weekly succession or otherwise—quite open, and it is not unlikely that if once a symmetrical monthly calendar were in operation, means could be found to attain all the other requisites of a perpetual calendar without infringing in any way the limits imposed by ecclesiastical authority.

It cannot, moreover, be denied that the observance of the week is embedded in the customs of the community, and a change in such customs might not be easily effected. On the other hand, as regards the correction of the month lengths, if the small changes required received legislative sanction, the almanacs and the daily newspapers would follow suit, and the thing would be done without any more trouble to any human being than accompanies the introduction of the 29th day in February under the present system. It is otherwise with the week. Moreover, the observance of the week prevails not only amongst the nations using the Gregorian Calendar, but amongst the adherents of the Orthodox Church, amongst Mahomedans, and even amongst other Eastern peoples, who could not easily be reached by legislation or international enactment.

As already pointed out, if any further change were to be found desirable, it might be brought about by an alteration in the length of the civil year ; and we may add that the major portion of its advantages could be secured by the employment of an adjustable calendar of quarterly engagements, a plan suggested by the present writer in 1911 in a paper which he read on the subject to the British Association at Portsmouth.

For all these reasons, we are decidedly of opinion that the advocates of calendar reform should exclude from their proposals any suggestion of interference with the succession of week days, and should confine them to the rearrangement of the months and of the position of the 366th day in Leap Year.

CHAPTER XIII

Proposals for the Readjustment of the Monthly Calendar

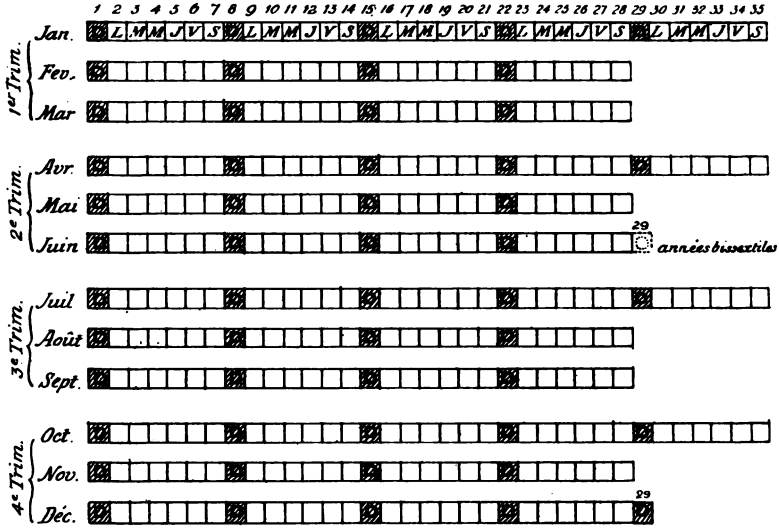
(I) MONTHS AS WEEK-MULTIPLES

THE proposals which have been made for the readjustment of the monthly calendar may be divided into two classes. First, those which endeavour in some way or another to make the month an exact multiple of weeks ; second, those which would make the calendar month as nearly as possible an even twelfth fraction of the year.

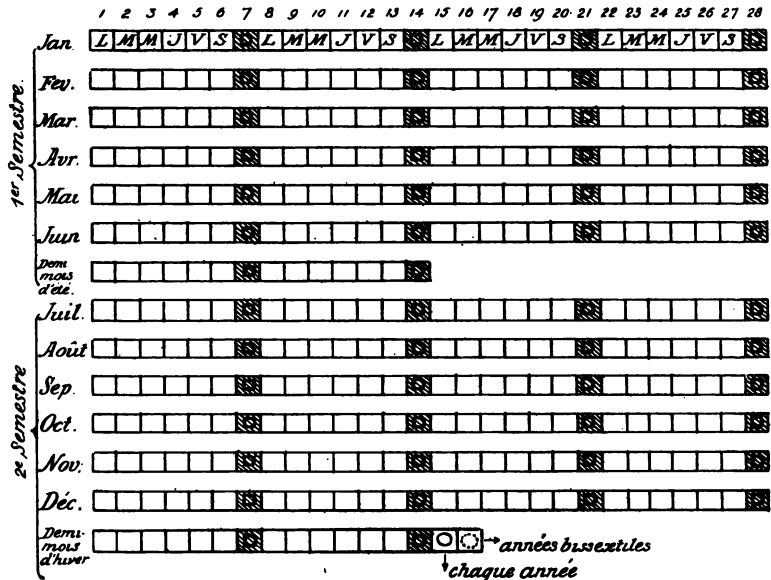
The former proposals sometimes take the form of 13 months of 28 days each ; sometimes two half months of 14 days are added to 12 months of 28 days. A proposal to divide each quarter into two months of 28 days and one of 35 days has been already referred to.¹ Such proposals have recently been

¹ Illustrations of two such proposals are here reproduced from an article in the *Bulletin commercial et industriel suisse*.

Projet de M. Arnold Kampe.



Projet de M. Reininghaus.



urged with considerable persistence, and it therefore becomes necessary to inquire whether they are practicable and whether they offer any advantages worthy of consideration.

In the first place, it is to be observed that unless accompanied by the enforcement of a perpetual correspondence between week day and month day they would be inoperative. For that reason we might perhaps lay them aside without further consideration. But even if that correspondence were secured, it is submitted that they possess no real advantage. For it must be remembered that if the *dies non* were adopted, the weeks, as already pointed out, would at once occupy a permanent and definite place in the year, would become miniature months, and that any attempt to group them in months would therefore from the very fact that it became possible, become at the same time unnecessary.

Apparently a supposed benefit of such an arrangement in the minds of many is the idea that the monthly number of any particular week day would be more readily memorised. Let us see whether this can be justified. Whatever plan we adopt as to the length of the months, whether these are arranged in

groups of 30, 30, 31, or of 28, 28, 35, if once a perpetual calendar is established, the relations between the week day and month day applicable to one quarter would be repeated thereafter for ever, so that whenever the relations for one quarter were memorised, we should be in possession of the calendar for all future time. Thus a 3-month perpetual calendar would be all that would be required for the ascertaining of any date, and it would occupy such a small amount of space that it could and would be printed everywhere, everyone would carry one about with him, and memorising would hardly be necessary. Further, there is no doubt that in such circumstances every child of ten would have already learned the necessary calendar by heart. It would be a much easier thing to acquire than the multiplication table.

But would the correspondence established by the 28, 28, 35 scheme be much or any easier to remember than the other? So far as regards the first 28 days of the first month they would be identical. The question only refers therefore to the remaining 63 days. We are satisfied that it will be found on examination that the numerical relation of these days is quite as simple under the one scheme as under the

other. Let anyone who may be doubtful set himself, without previous preparation, to answer off-hand the dates of any given week days, say the third Sunday, the fourth Monday, of the second or third month under each system, and he will at once discover the truth of what we have said. For it is to be noted that under the former system only the Saturdays would be exact multiples of seven. In recalling the date of any other day an addition or subtraction must be made. Exactly the same operation with two added or subtracted would give the date under the other system. The advantage of easier memorising is therefore found on examination to be purely fanciful.

But even if there were such a gain it would be of no material importance. It is really a very trifling matter compared with the real and solid advantages of a symmetrical calendar, and should not for a moment be placed in opposition to more serious considerations.

It is sometimes mentioned as an advantage of this proposal that—if it were conjoined with a perpetual calendar—every month would always begin with a Sunday. We do not know whether this is regarded as a distinct and separate advantage, or whether it is merely

another way of stating the supposed benefit of simpler memorising. But we feel satisfied that so far from being an advantage, it would be found to be very distinctly a disadvantage. It is decidedly a better plan that only one month in three should begin on a Sunday, and thus that in two months out of three the first day of the month should be available for ordinary civil and secular business. It might, we believe, prove to be rather a serious matter if the first day of the month were never available for such purposes. Yet this disadvantage is nothing compared to the fatal difficulty that such a proposal would absolutely destroy the calendar month as a practical instrument for the enumeration of days.

The month being the unit by which days are enumerated, it is desirable that the lengths of the months should be as nearly as possible the same, so that as far as possible the same interval may always elapse between the same numerical date in any two or more months. The drawback caused by the irregularity of February has already hampered the use of the calendar month for this purpose, and has prevented its employment for many purposes for which it would otherwise have been suitable.

With this disturbing element removed, there is every reason to believe that its use would be largely extended.

But the month is used not merely as an instrument for the enumeration of days but as the measure of a period. Its utility in this respect is very great, but again has been hampered hitherto by the irregularity of February. There is no doubt that its employment for this purpose would be altogether destroyed were the months to vary from 28 to 35 days in length. The word month could no longer have a definite meaning, and could not therefore be utilised as a standard measure of time. We should require to distinguish between long months and short months, and we leave it to the reader to imagine the confusion that would ensue.

Those who have aimed at making the month a multiple of weeks are therefore confronted with this dilemma: either recognising the necessity for uniformity in the lengths of the months they must accept 13 months of 28 days, or else, recognising the necessity for maintaining the number of months at 12, they are compelled to destroy their uniformity in point of length.

As regards the former alternative, we have found that in itself a 30-day period is for most purposes superior to a 28-day period. To make the months conform more nearly to a 30-day standard is a simplification which follows the lines on which the month has naturally developed. To substitute months of 28 days is to introduce a new standard of length for the month, one, moreover, which would deprive it of the immense advantage of being a twelfth fraction of the year.

It was the recognition of these defects which led certain parties to endeavour to retain the month as a twelfth of the year by the expedient of four- and five-week months. But the device is entirely fictitious. Neither of these periods is even approximately a twelfth fraction of the year, and obviously, if the month sometimes means one period and sometimes another, its use as a definite fraction of the year is at an end.

It is fortunate that the advocates of this proposal went the length of putting their plan in the form of a Parliamentary Bill. This imposed upon them the necessity of introducing clauses with the view of making their calendar operative, and a perusal of these clauses is

sufficient to show how cumbrous and unworkable such a scheme would be. As was pointed out in *Nature*, 26th October 1911, special legal provision is required for payments in the case of monthly contracts to be made proportional to the length of the month concerned. Moreover, a legal definition is required for the duration of a month from any given date. The clause which endeavours to provide for this is worth reproducing. It is as follows :—

“In calculating monthly periods the following rules shall apply. In any period beginning in a long month and ending in a short month, the last day of the short month shall be held to be the corresponding day to any of the days in the last week of the long month.”

As the writer in *Nature* points out, this clause seems to imply that the month may mean any period from 28 to 35 days, and, as he adds, the clause comes perilously near to a *reductio ad absurdum* of the whole scheme. He puts the following simple question, and leaves it to the promoters of the scheme to find a solution :—A domestic servant is engaged on March 32 at £22 a year,—what is the amount of the first monthly payment, and when will it be due?

We are indeed convinced that even the complicated clauses which this Bill contains would not provide machinery sufficient to enable such a scheme to work satisfactorily. In a word, it might be said that the proposal is altogether unsuited to the needs of the commercial community. It appears, however, to be attractive to the minds of some, and we have thought it necessary therefore to discuss it at a length which its merits hardly deserve.

The fact is that while a perpetual correspondence between the *week day* and the *month day* would confer many advantages, no such advantage would result from a correspondence between the *week length* and the *month length*. After innumerable attempts it may safely be said that such correspondence is unattainable without one or other of the disastrous consequences above described. Fortunately, there is no necessity for the weeks and the months to coincide oftener than at the dates when accounts are usually balanced. A quarterly correspondence is all that is required, and that is equally well secured by the other class of proposals.

Both in respect of use and of origin the week and the month are radically distinct. Except

in connection with labour, the week is not suited to be a calculation period. It is seldom employed as such in commerce, banking, or finance, and if the months could be regularised, it is quite likely that the wages question would be solved by making wages payable on the 15th and 30th of the calendar month. But however that may be,—with quarterly periods of 91 days, either arrangement would be equally convenient. Indeed, if under such a calendar the use of four- or five-week periods were found to be desirable, there would be nothing to prevent their employment. It would develop naturally. But such periods would not be calendar months, and nothing but confusion could result from any attempt to force them into that position. In a word, it is evident that the proposal proceeds upon an entire misconception of actual requirements and would confer no real advantages, whilst it would involve a disturbance of existing arrangements which is altogether absent in the case of proposals of the second class, to which we shall now direct our attention.

These proceed on the footing that the month must be accepted as fundamentally different from the week. In relation to the year, it

represents the useful fraction of one-twelfth, whilst the week is not an aliquot part of the year at all. Indeed, the week, as we have seen, is not really historically a part of the civil astronomical calendar, but rather an instrument for defining and apportioning the claims of religion and daily labour amongst the days. Both the Julian and Gregorian reforms were therefore limited to the civil calendar properly so called, and were in no way concerned with the week.

CHAPTER XIV

Proposals for Readjustment of the Monthly Calendar

(2) SYMMETRICAL MONTHS

WE come now to those proposals which aim at the establishment of four equal quarters of 91 days, divided into two months of 30 and one of 31 days each, the 365th and 366th days being also symmetrically located.

Of these proposals there are only two which require our attention. First (A), the proposal to set aside the first day of the year as Year Day or New Year's Day, and to arrange the following 364 days in four groups of three months containing 30, 30, and 31 days each. The Leap Day under this system is intercalated between the end of June and the beginning of July, and corresponds at the commencement of the second half of the year with the position of New Year's Day at the beginning. Second (B), the proposal which divides the year into four quarters

of three months, each consisting of one month of 31 days and two months of 30 days, but adding, however, the 365th day as 31st December and in Leap Year adding the Leap Day as 31st June.

Plan A is that formulated by Professor Grosclaude in his widely accepted proposal, and as it happens is also the scheme which was published by the present writer in his pamphlet already referred to.¹ Whilst there is very little to choose between the two plans, it may fairly be maintained that plan A, taken as a whole, will be found to be the most simple, symmetrical, and perfect which has been or can be devised for the simplification of the monthly calendar. An inspection of the comparative diagrammatic illustrations of the different schemes will, we think, support this view.

The main argument which has been advanced in favour of plan B has been that, taken in conjunction with a perpetual calendar, it would give five Sundays in each 31-day month, and four Sundays in each of the other two.² There would thus be in each month a perfect equality of 26 *jours ouvrables*. This object Professor Grosclaude attempted to secure in his calendar

¹ See p. 57.

² See p. 56.

by commencing each quarter with a Monday. This, however, is at once regarded as an attempt to alter the first day of the week, and for this reason there is little doubt that the Grosclaude proposal in its entirety would never be accepted. The present writer made no attempt to secure such uniformity of *jours ouvrables*, believing that it would be of little or no practical value. The amount of time devoted to labour within any particular month is seldom dependent exclusively upon the number of Sundays which that month includes. In many countries a large amount of work appears to proceed on Sundays quite the same as on other days, whilst in other countries the amount of working time is affected not only by the interruption of Sundays but by Saturday half-holidays, not to mention other breaks. In any case, a variation of working days in each of the three months of the quarter, provided that such variation was rhythmical and orderly, would not, in the writer's opinion, be found in any way objectionable. At the same time, he feels bound to recognise the fact that the equality of *jours ouvrables* appears to many, whose opinions are worthy of respect, a matter of some importance, to be kept in view in the possible

event of a perpetual weekly calendar being subsequently arrived at.

A more serious consideration, however, in arriving at a decision, is that plan A requires for its symmetrical working the exclusion of the 365th and 366th days from the monthly enumeration. No doubt it is possible to include each of these as days of the month, and provision was duly made for this in the plan as embodied in the Calendar Amendment Bill of 1912. But it must be admitted that this can only be secured by interfering slightly with the symmetry of calculations. If under this plan New Year Day be computed as the 1st of January, then the period from any given date in January to the same date three months later is 92 and not 91 days. The same disparity occurs no doubt under plan B, when the period of calculation includes the 31st of December; but under that plan the year up to 30th December is unaffected, and complete uniformity can be secured by simply excluding the 31st of December from the calculation, whilst it is not admissible so to treat the 31st of January, which must be held to be one of the ordinary working days of the year.

It is maintained by some—and we admit the

force of the contention—that the calendar should provide a place for every day of the year within one or other of the twelve months which have been for so many centuries recognised as the complete and exhaustive subdivisions of the year ; that, indeed, a calendar should supply a purely unappropriated framework of days without earmarking any special days as blank days, holidays, year days, or the like,—leaving all questions as to which days are to be set aside for any one purpose or another to be dealt with otherwise, without the decision being prejudiced by anything in the nomenclature of the almanac.

If this proposition be accepted, then we are ready to admit that the plan B is the best which can be devised.

Another advantage to be found in plan B is that under it Leap Day would be enumerated as the 31st of June. It is decidedly better to have a day which only occurs occasionally placed at the end of a month and numbered with a number not hitherto appropriated, than to have it declared to be the 1st of July in Leap Years, the necessary extra day being added at the end of that month. As no such date as the 31st of June has hitherto existed, there can be no

fixtures dependent upon it, and it is for that reason specially suitable to be observed as a general holiday.

The important thing about the 366th day is to provide that it shall not occur in the middle of a quarter. This is, indeed, one of the most essential points in the whole problem of calendar reform. If in our present calendar Leap Day had not broken in upon a quarterly period, it would have been at least theoretically possible to have worked into an arrangement of four equal quarters, notwithstanding the irregularities in the lengths of the present months. It would not certainly have been easy, but the interruption of Leap Day renders it impossible. In respect of the position of Leap Day, however, nearly all the proposals which have been made have more or less recognised that its position should be extra trimestrial. So far as this is concerned, both plans now under discussion are equally sound.

It is a further advantage of plan B that under it the calendar between 1st September and 28th February would be absolutely unchanged and unaffected. It is for several reasons important to leave the calendar at the beginning and at the end of the year quite unaltered.

Dates would be advanced in ordinary years by *one* day in April, June, July, and August, and by *two* days in March and May; in Leap Years by *one* day in March, May, July, and August. That is the change. A similar dislocation takes place at present in Leap Years as compared with ordinary years. Though it extends over ten months, it is practically unnoticed.

On the whole, the differences between the two plans are really small; and as no progress can be made until a general agreement is arrived at, it is suggested that all should agree to support the proposal for a calendar in conformity with plan B. It is at any rate certain that this plan involves an absolute minimum of change in the existing arrangements. It requires only three slight alterations in the lengths of the existing months, and the placing of the Leap Day in a much more convenient position than it at present occupies, whilst at the same time it seems to contain all the essential advantages of a calendar reform, and to require no changes to be made which would ever afterwards fall to be retraced.

There can be no doubt that every possible alternative scheme has now been fully described and considered, and the time seems ripe for a step in advance, in the shape of united action

on behalf of one simple and practical scheme. When we consider the enormous advantages which changes so extremely simple would entail not only to the commercial community but to every rank and class of society, and when we consider how very easily these changes could be effected, we can hardly bring ourselves to believe that the world will much longer refuse to help itself to the benefits which lie waiting to be picked up. We are even convinced that the increasing confusion and complexity of social arrangements will very soon compel action to be taken ; and although the present proposals do not at all affect the ecclesiastical calendar, we are also well assured that it would be worth while for the ecclesiastical authorities to place themselves in co-operation with the Chambers of Commerce and other civil associations which are advocating the reform. They might thus secure the establishment of a system which would remove so many defects of our present calendar, that the result would be to give the Churches a much easier task to face in dealing with any questions which may subsequently arise in regard either to the fixing of Easter or of other elements of the ecclesiastical calendar.

*Plan shewing the Symmetrical Monthly Calendar now proposed
by Professor Dr. W. Koppen, Mr. Alexander Philip, F.R.S.E.,
Dr. W. Buschung, Halle, Rev. Pastor Rosenkranz, Mr. I.S. Allen
and others*

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1 st Trimestre	Janua																															
	Febr																															
	Mar																															
2 nd Trimestre	April																															
	May																															
	June																															☉
3 rd Trimestre	July																															
	Aug.																															
	Septem																															
4 th Trimestre	Octo																															
	Nov.																															
	Dec.																															☿

*Table of corresponding dates, under the present Calendar
and the Symmetrical Calendar delineated above*

I. - Ordinary Years

Sept 1 Feb. 28	Sept. 1 Feb. 28	From 1 st September to 28 th February. - No change -									
Mar. 1	Feb. 29	Apr. 1	Mar. 30	May. 1	Apr. 30	Jun. 1	May. 30	Jul. 1	Jun. 30	Aug. 1	Jul. 31
Mar. 2	Feb. 30	Apr. 2	Apr. 1	May. 2	Apr. 31	Jun. 2	Jun. 1	Jul. 2	Jul. 1	Aug. 2	Aug. 1
Mar. 3	Mar. 1	3	2	May. 3	May. 1	3	2	3	2	3	2
4	2			4	2						
31	29	30	29	31	29	30	29	31	30	31	30
Difference 2 days		1 day		2 days		1 day		1 day		1 day	

II. - Leap Years. -

Sept. 1 Feb. 29	Sept. 1 Feb. 29	From 1 st September to 29 February. No change -									
Mar. 1	Feb. 30	Apr. 1	Apr. 1	May. 1	Apr. 31	Jun. 1	June 1	Jul. 1	Jun. 31	Aug. 1	Jul. 31
Mar. 2	Mar. 1	2	2	May. 2	May. 1	2	2	Jul. 2	Jul. 1	2	Aug. 1
3	2			3	2			3	2	3	2
31	30	30	30	31	30	30	30	31	30	31	30
Difference 1 day		None		1 Day		None		1 Day		1 Day	

CHAPTER XV

A Proposed International Agreement

As we have already indicated in the foregoing pages, the arrangement of the months in four groups of three months, consisting of 31, 30, and 30 days was suggested by M. Hanin at the Paris competition in 1884. M. Hanin moreover has, it is believed, latterly favoured the placing of Leap Day at 31st June rather than at 32nd December. Such an arrangement admits of both the 365th and 366th days being easily enumerated by a monthly number, whilst at the same time such a calendar contains no month of more than 31 days. A similar plan has been suggested by Professor Dr W. Köppen of Hamburg and by Dr W. E. G. Büsching of Halle a/S, and other students of the subject.¹

¹ See an excellent pamphlet by Dr Büsching entitled *Die Kalenderreform*, Halle, 1911, price 80 pf. ; also *La Reforme du Calendrier*, by M. Armand Baar, Liège, C. Desoer, 1912.

This arrangement of months has been favourably received also by the Illinois Academy of Science, by a Committee of reformers in Moscow, and by others in various quarters. It may naturally be expected to be viewed with favour in Russia, for it is equally suitable and advantageous to the Julian as to the Gregorian Calendar. Indeed, its adoption in both would simplify the stating and memorising of corresponding dates under the two styles, whilst at the same time it would raise no kind of obstacle to the subsequent adoption of the Gregorian Calendar by the adherents of the Orthodox Church, or *vice versa*.

Convinced that such a rearrangement of the civil or monthly calendar is the *one* and *only* practical proposal before the world to-day, the author, after consultation with the above-mentioned gentlemen, has drafted the following manifesto, which has obtained the adhesion of Professor Nýland, Utrecht, and of Dr Köppen, Herr Büsching, the Rev. Pastor Rosenkranz, and many other authors of plans. This manifesto is intended to serve as a general basis for united international action.

UNITED MANIFESTO BY ADVOCATES OF CALENDAR REFORM

'WHEREAS we, the undersigned, have for some time been interested in a Reform and Simplification of the Calendar now in use in Western Europe, America, and elsewhere, with a view to equalising the four quarters of the year, = alleviating the irregularities of the months, and establishing a perpetual correspondence between the day of the week and the day of the month, and have supported one or other of the several proposals which have been formulated for effecting these reforms; AND WHEREAS said proposals usually provide for placing the 365th day of every year and the 366th day of Leap Year without the weekly and monthly enumeration; AND WHEREAS we have found that in certain quarters—both ecclesiastical and scientific—objections, possibly often sentimental, but none the less firmly held, have been stated to the employment and adoption of these expedients; AND WHEREAS it is obviously desirable that any simplification of the calendar should be generally acceptable to ecclesiastical, civil, and scientific opinion; AND WHEREAS we

are satisfied that a valuable reform can be effected without incurring these objections,—

Therefore, we have resolved to unite in urging and advising that the very simple changes undernoted should now be made in the Julian and Gregorian Calendars by international agreement, namely :—

(1) The months of March and August shall each yield a day to February.

(2) The month of May shall yield a day to April.

(3) The 366th day in Leap Year shall be 31st June.

The monthly calendar will then stand as follows :—

January 31 days	April 31	July 31	October 31
February 30 „	May 30	August 30	November 30
March 30 „	June 30 (31)	September 30	December 31

We make these recommendations for the following REASONS, namely :—

1. To the changes here proposed no objection has been stated, either by astronomers or by the ecclesiastical authorities.

2. Their adoption would leave the States concerned entirely free and untrammelled in subsequently deciding whether any further changes were necessary or desirable, and under

no circumstances would it be necessary to retrace or revoke these changes.

3. The changes now proposed concern only the monthly calendar, and could be introduced without causing the slightest disturbance of any of the existing arrangements which regulate public business, civil polity, commerce, industry, or social life.

4. In respect that the equalisation of the quarters involves an earlier date of the vernal equinox, the changes proposed are a necessary preliminary to the treatment of the question of the fixing of the date of Easter—should the Churches decide to deal therewith.

The following, among other ADVANTAGES, would immediately result from this reform :—

1. It would remove the anomalous length of the month of February, which, arising from its position at the end of the Roman year in the pre-Julian Calendar, has now no justification, either scientific, legal, or historical.

2. The lengths of the months, being always either 30 or 31 days, and these succeeding one another in regular order, a standard month would be practically attainable, and the utility of the calendar month as a measure of time would be greatly increased.

3. Every year would contain four successive quarterly periods of exactly equal length, namely, 91 days—leaving one odd day over at the end of the year.

4. Each successive *trimestre* would contain exactly 13 weeks.

5. With the exception only of periods which include the 31st December or 31st June, the interval between any given date and the same date three months later would always be 91 days. The exceptions named would be very easily memorised, and for many purposes it would be found convenient to omit the 365th and 366th days in the computation of days.

6. With the same exceptions, any given day of the month would be the same day of the week as the corresponding day three months later or earlier.

7. The weekly and monthly calendar for a period of three months would be repeated exactly for each of the four quarters in any ordinary year, and for each of the first two and last two quarters in every Leap Year.

8. Seven such trimestrial tables would contain all the possible variations of the week day-month day calendar for ever.

9. A great simplification would thus be

effected (*a*) in the calculation of interests and discounts, salaries, wages, rents, and other periodical payments. (*b*) In the use of statistics, and in the keeping, auditing, and checking of books of account. (*c*) In the arrangement of sessional work, such as sessions of Law Courts, Schools, Universities, Local Authorities. (*d*) In the adjustment of holidays, and the arrangement of traffic Time-tables. (*e*) In the Tables of the Dominical Letter for future dates.

10. The intercalary day in Leap Year would occur after Easter.

11. The intercalary day would occur between two *trimestres*, and on a date hitherto unappropriated, and specially suitable to be observed as a general holiday.

12. A principle of harmony and rhythmical succession would be introduced into the calendar which would beneficially influence all the arrangements of civil life and the habits of Society.

TABLE
showing the length of two, three, and four
consecutive months in the present and
the simplified Calendar.

NOTE.—In both cases the 366th day and, under
the simplified Calendar, the 365th day are
excluded from the enumeration.

Under present Calendar. *Under proposed Calendar.*

Length of two consecutive months.

59	61	62	61	61	61	61	61
59	61	61	61	60	60	60	60
61	61	61	62	61	61	61	61

Length of three consecutive months.

90	91	92	92	
89	92	92		
92	92	91		all 91

Length of Quarter.

90	91	92	92	always 91
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Length of four consecutive months.

120	122	123	122	122	122
120	123	122	121	121	121
122	122	122	121	121	121

CHAPTER XVI

The Date of Easter

QUESTIONS affecting the festival of Easter have for many centuries,—indeed throughout the Christian era,—largely influenced discussion and decisions about the calendar. It was, in fact, the difficulties which had arisen in the determination of the Easter date which led to the introduction of the Gregorian Calendar, whilst to-day the desirability of establishing a fixed date for Easter appears to many the most pressing of all calendrial problems. The ascertainment of a rule for the determination of Easter dates is largely responsible for the elaborate development of calendar tables and calculations which are to be met with in systematic treatises upon the calendar, and which are an abiding monument to the ingenuity and patience of the ecclesiastical astronomers of the Middle Ages. But without reference to these, the essentials of the problem can be quite simply stated.

The key to the study of the Easter question

must be sought, in the first place, in a reference to the Jewish feast of the Passover. As is well known, the Jews, by divine command, were appointed to celebrate their delivery from Egypt by the commemorative feast of the Passover, which commenced with the Paschal supper of which the Jews were directed to partake on the 14th day of the first month. The Jewish sacred or ecclesiastical year was at the same time appointed to commence with the vernal equinox; the civil year, on the other hand, commencing as it had previously done, with the autumnal equinox. As the Jewish months were lunar, the 14th day approximated to the time of full moon, and as the first month commenced with the vernal equinox, it followed that the Passover fell to be celebrated about the time of the first full moon thereafter.

The Crucifixion of our Lord took place on a Friday, and the Last Supper with His disciples on the previous Thursday evening. It appears from the scriptural narratives that the Passover was observed by Caiaphas and the Jewish priesthood on the Friday, and innumerable discussions have taken place as to the reason why the Passover was observed by our Lord upon the Thursday and by Caiaphas on the Friday.

When the Church came formally to institute the festival of Easter, a division soon manifested itself over the question whether the practice of Christ and His disciples was to be followed, or whether the commemoration was to take place on Good Friday, the actual date of the Crucifixion. The Eastern Church favoured the Thursday observance, and accused the other party of following the practice of Caiaphas rather than that of Christ. The Roman or Western Church, however, adhered firmly to the observance of the actual date of the Crucifixion. The two parties were named respectively the *Quarta-decimans* and *Quinta-decimans*, and after much debate the question was determined in favour of the Western view at the Council of Nice, over which the Emperor Constantine presided, in 325. The decision of this Council did not, however, altogether allay dispute, which broke out again in England several centuries later, and was not settled without bloodshed.¹

Looking back now upon this long dispute, it

¹ It was not until 716 that the English clergy submitted themselves to the Papal rule in this matter. A Council held in England in 599 had affirmed the Eastern rule. In retaliation Ethelfrid, the Northumbrian King, at the instigation of the Roman party, massacred 1200 monks at Bangor who adhered to the *Quarta-decimans*.

seems not improbable that it was due largely to a misunderstanding. The Jewish day was computed to run from sunset to sunset, and accordingly when Christ and His disciples ate the Last Supper after sunset on Thursday night, they were observing the Passover after the following day had by the Jewish rule commenced.

The Council of Nice further decided that the Resurrection should always be celebrated on a Sunday. They accordingly decreed that the feast of Easter, by which all the other movable feasts and festivals are regulated, should be observed on the first Sunday after the first full moon which happened *on or after the 21st of March*. Had the terms of the decree been *after the vernal equinox*, no ambiguity or difficulty could have arisen. But for some reason or other the expression used was "after the 21st of March." At the date of the Council, A.D. 325, the 21st of March was the date of the vernal equinox. Under the Julian calendar the equinox fell originally upon the 25th of March, but owing to the fact already mentioned, that the Julian year was about eleven minutes longer than the tropical year, the date of the equinox had receded to the

21st of March by the time when the Council of Nice was held. This gradual retrocession of the date can hardly have escaped the observation of the advisers of the Nicean Council, but they made no provision for it, and do not seem to have noticed that, as a necessary result, in course of time the 21st of March, instead of being the day of the equinox, might have been the day of the summer solstice. Thus the fast of Lent and the festival of Easter would, after the lapse of many centuries, have come to be observed in the middle of summer. It was to obviate this slow movement of the Easter date through the seasons of the tropical year that the Gregorian reform was introduced. It can hardly be questioned that it was a wise course to guard against the gradual increase of this error, and to ensure a more exact correspondence between the lengths of the calendar and the tropical years, although at the same time it must be admitted that the error was so small, and its accumulation so slow, that except in connection with the question of Easter it had not occasioned any appreciable inconvenience. But whilst we may acknowledge that it was desirable to stay the accumulation of this error, it may certainly be doubted whether it was wise

or necessary to make the reform retrospective, to undo the error which had already accumulated since the date of the Council of Nice, and to restore the date of Easter to its original relation to the 21st of March.¹

Such, however, was the course adopted by Pope Gregory XIII., and in consequence the world since then has suffered by the confusion and inconvenience of the conflict between the new and the old styles.

In the Act of Parliament by which the Gregorian Calendar was legalised in England, there will be found rules and tables from which the times of Easter may be found for any number of years to come. These tables are based upon the Metonic cycle of 19 Julian years.² Although a recourse to astronomical observation does not always give the same result, it is nevertheless true that little confusion has arisen from the regulation of Easter in accordance with these tables.

¹ This view of the Gregorian reform was clearly stated as long ago as 1819 by the Venerable Archdeacon Brinkley, F.R.S., in his *Treatise on Astronomy*.

² The Metonic cycle was first employed in the determination of Easter by Anatolius, bishop of Laodicea in A.D. 270. The Western Church preferred a cycle of 84 years, until Victorius of Aquitaine in 457 based the computation on a

It will be observed from what we have stated that the ecclesiastical calendar based upon the determination of Easter is luni-solar,—depending first upon the date of the vernal equinox, and secondly upon the period of the moon's synodic revolution. So long as it is required that Easter shall fulfil both requirements, the observance of that festival upon one fixed date annually is impossible. Of recent years in many countries a strong feeling has arisen in favour of a fixed date for Easter. The movement is particularly active in such countries as Germany, in which the date of many of the civil fairs and markets is dependent upon the date of Easter. That these should constantly fluctuate within a range of 35 days, and should sometimes fall at an inconveniently

cycle of 532 years,—the multiple of the solar (28-year) cycle and the Metonic (19-year) cycle. The table of Victorius became the law of the Church by a Canon of the Fourth Council of Orleans in 541. After the introduction of the Gregorian Calendar, authoritative tables were published by the Jesuit astronomer Clavius. These were simply an adaptation of the 532-year cycle to the Gregorian year. In all these the Metonic cycle is assumed to be perfect, and the full moon is taken as the opposition of mean sun and mean moon. Hence the calendar full moon does not always coincide with the actual full moon.

early season, has given rise to much discontent and dissatisfaction ; but no solution has been suggested, or indeed, can be supposed possible, which does not involve a departure from the principle that Easter should be celebrated at the time of full moon. Whether the ecclesiastical authorities will consent to the adoption of a fixed date, irrespective of the moon's age, is primarily a question for them to determine.¹ Certain religious associations would, of course, be interfered with. It was by the light of the full moon that Joseph of Arimathea carried away the body of Jesus. So far as the secular fairs and markets are concerned, the Churches may fairly reply that there is no necessity why these should be made to follow the fluctuations of Easter. In any case, it seems pretty certain - that the Jewish Church will never consent to observe the Passover at any date which does not correspond with the 14th day of the moon's age. Even for the Christian Churches, the question is likely to be one of difficulty. Here it is important to observe that the deter-

¹ The subject is understood to be at present under consideration by the Congregation of Rites, and Mgr. Lepidi and Cardinal Merry del Val have indicated that it is not a matter of dogma but "un acte de gouvernement."

mination of Easter ought to *follow* rather than to *precede* the establishment of a normal monthly calendar. Owing to what may be called the greater amplitude of oscillation of Easter dates, the disturbance caused by their fluctuation is more obvious than that due to the other irregularities of the civil calendar. But the latter are more constant in their operation. They affect the entire year; and it is thought that their disorganising influence is really much greater than anything which can be attributed to the variable Easter date. In any case, a symmetrical readjustment of the lengths of the months and the dates of the Ephemerides ought obviously to precede any measure which may be taken for fixing the dates of particular feasts attached to particular days of the calendar; whilst if the advantages of a normal civil calendar were once secured, the way would be paved for a clearer understanding of the other and subsequent questions, and it is not unlikely that by this means many of the difficulties associated at present with the variability of Easter might either be modified or altogether removed.

CHAPTER XVII

A Rhythmic Year

IT would be a fascinating speculation to endeavour to picture in detail the order of life under a perpetual calendar, but as we have decided that such a calendar is not for the present practicable, we shall refrain from the attempt.

We may, however, be allowed to summarise the principal advantages which would be derived from the symmetrical rearrangement of the civil calendar.

One obvious consequence of its introduction would be the more extensive employment of the quarterly period or *trimestre*. Each quarter would rhythmically correspond to its predecessor in the length and order of the subdivisions of which it was composed. Quarterly periods of 13 weeks and three months continually succeeding one another would lead to order and harmony in all the arrangements

of public business and society. It is true that in successive years the commencing week day would be changed. The change, however, would be a regular one. The commencing week day of the first quarter would be the commencing week day of each quarter of the ordinary year. Pay-days might be varied accordingly. The whole scheme of arrangements would be adapted to correspond. Each of the seven different possible quarterly calendars would be identified by reference to its commencing week day, which might be said to give the keynote to the arrangements of that year.

These advantages are quite apart from the simplification, which we have already dwelt upon, in all calculations of wages, rents, interests, and other periodical payments, and in the framing of cash-books, pay-sheets, rent-rolls, traffic returns, and other statements of accounts.

It is evident, also, that the various legal terms of notice, which are at present in a state of endless confusion, would be standardised. The times of notice, or to use a Roman legal term, the *induciæ*, upon the service of summonses, the times allowed for various appeals, the period

of intimation required for public obligations, the notice to be given in summoning public or commercial meetings,—all these and many other legal obligatory periods of the same kind, with which the whole statute book is at present interspersed without any order or method, could be made regular and systematic, and a foundation would thus be laid for the realisation of that dream of the jurist—the codification of statute law.

Take, again, the incessant and irritating alterations and variations which are constantly made in our railway and other traffic time-tables. A very large proportion of these are the consequence of the ceaseless variations in business arrangements which our irregular calendar entails. With a rhythmic year, whilst we do not say that our time-tables would be stereotyped, it is nevertheless true that their main features would be more and more perfectly standardised, the changes required being fewer in number and directed steadily towards the establishment of a more and more perfect working plan, with a consequent large reduction in working costs and lessening of the risk of accidents and delays.

With regard to the orderly arrangement of

the dates of public appointments, such as fairs, markets, holidays, openings of school and college sessions, meetings of local authorities and magistrates and the like, we have already seen how the clashing of such dates continually arises under our present calendar, owing to the incongruity of the week. A perpetual calendar would immediately solve these difficulties ; but without resort to that expedient the same practical result might be arrived at in the following way :—Every symmetrical quarter of 91 days is equivalent, we have seen, in length to thirteen weeks ; but owing to the variation in the correspondence of week days and month days, it is only occasionally that the quarter will contain thirteen exact and complete weeks. It will, however, always contain twelve complete weeks, commencing with the first Sunday and ending with the twelfth Saturday. The thirteenth week will constitute a remainder over, either wholly at the end or partly at the commencement and partly at the end of the quarterly period. Now, if we take a calendar of these twelve weeks, we can transfer to it the different appointments and engagements of any given quarter. Taking the first quarter of the year, the first four weeks would accommodate

the January engagements, the second four those of February, and the third four those appropriated to dates in March. Having filled up our twelve-week calendar with these engagements, we now have them definitely placed in a permanent relation to each other. All we require to do is to place this calendar alongside a calendar of the monthly dates of the quarter in question, and by moving the weekly calendar upwards or downwards as the case may be, we obtain the day and date of all such engagements and appointments for any particular year, whilst at the same time they remain in a fixed and permanent relation to each other, and the risk of clashing or overlapping is altogether avoided. In this way the main advantages of a perpetual calendar could be secured without the application of a *dies non* to the week day. It is true that between each of the quarters there would intervene one blank week, which would serve, if one might say so, as a sort of buffer separating the public engagements of one quarter from those of another, and providing a quarterly interval which would be comparatively free of all such engagements. The time available for these in any one year would, under such a

scheme, be limited to forty-eight weeks, but it is thought that this limitation would be distinctly beneficial and would greatly facilitate the harmonious operation of the various public services.

The scheme of such a perpetual adjustable calendar was exhibited by the present writer to the British Association at Portsmouth in September 1911, and is represented in the accompanying illustration.

Every community and corporation, every town, every college, every society, every railway company—indeed, every individual—might have their or his perpetual adjustable calendar, adapted to their requirements. In the first instance, at any rate, legislation would not be resorted to.

All that is required is the adoption by international agreement of the few simple changes necessary to provide a symmetrical monthly calendar, followed in each country by a short statute of three or four clauses to give effect to the international understanding. Such a statute need have no penal clauses; no inspectors or other officials would be required to see to its enforcement. Let the Act be passed, and the almanacs and newspapers might

be safely trusted to do the rest. The change whilst universally beneficial would cost nothing to initiate.

In the present day an impression seems widely to prevail that unless a reform costs money it must be of no value.

Political parties seem always disposed to associate their projects of improvement with the appointment of armies of officials, the raising of loans, and the imposition of a new tax. Some urge that import duties are the cure for all social ills; others cry out for increased taxes on land or on capital. Nearly all seem to overlook the universal benefits which the simple act of adopting a more rational calendar would confer on every class and section of the community,—benefits which can be had for the taking, and which are literally available “without money and without price.”

APPENDIX

Draft of a Calendar Amendment Act

AN ACT for amending the arrangement of the days of the months under the Gregorian Calendar and for other purposes in relation thereto.

Be it enacted, etc.—

First.—In every year, commencing with the year 19 , the days of the year shall be apportioned amongst the months as follows :—

Jan. 31	Apr. 31	July 31	Oct. 31
Feb. 30	May 30	Aug. 30	Nov. 30
Mar. 30	June 30	Sept. 30	Dec. 31

Provided always that in each Leap Year the month of June shall contain 31 days.

Second.—In every Leap Year the thirty-first day of June shall be known as Leap Day, and shall be a public and Bank holiday within the meaning of the Bank Holidays Act 1871, and shall not—except where especially mentioned or provided for—be held to be included in any computation of days made for the purpose of estimating the amount of any apportionable payment.

Third. — Every appointment or fixture falling or occurring, and every payment or obligation demandable or prestable, and every period expiring or becoming completed on the 31st day of any month, which, under the provisions of the first section hereof, contains only 30 days, shall be deemed to fall, occur, become demandable or enforceable, expire, or become completed on the 30th day of such month, and in general wherever in such a case the 31st day of any such month is specified or referred to, such specification or reference shall be held to apply to the 30th day of the said month.

Fourth. — Excepting as provided in section third hereof, every appointment or fixture falling or occurring, and every obligation demandable or enforceable, and every period expiring or becoming completed on any day of the year identified by the monthly enumeration hitherto in use, shall be deemed to occur or fall, become demandable or enforceable, expire or become completed on the same day of the month by reference to the monthly enumeration as now amended, notwithstanding that any such date may, in consequence of such amendment, happen or fall upon a different day of the year than as heretofore by enumeration of days from the first day of the year; providing always that this section shall not apply to the dates of the Ephemerides or other astronomical events dated in the calendar upon the days of their actual occurrence, but shall apply to all commemorations, anniversaries, or to the coming of age of any person or other the like event depending on the duration of any human life.

Fifth. — In every document, whether written, printed or otherwise visibly expressed which shall be made or executed after the date when this Act shall come into operation, every reference to or statement of any date subsequent to the date aforesaid, shall be legally understood, interpreted, and enforced in terms of the provisions herein contained, and so far as inconsistent with the provisions hereof but no further, the Statute De Anno bissextili 21st Henry III.; The Calendar (New Style) Act 1750, and the Act 22 Victoriae, cap. 2, shall be and are hereby repealed.

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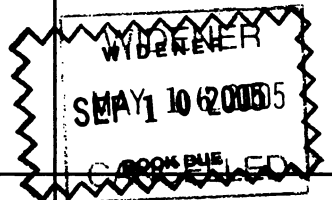
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